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ABSTRACT

A decade of professional research on drug abuse has produced both an abundance of materials and a vocabulary that is not shared by planners, clinicians, and policy makers. This handbook compiles the major developments of the period and their treatment and research implications in a style intended to be understood by all three types of professionals. Over 40 authors surveyed the literature in their own area of expertise, often including their own viewpoints and recommendations. The nine sections of the book range from the history of the field through treatment modalities, as well as specific methods for specialized needs; specific drugs or classes of drugs; drug use from both a psychosocial and epidemiological perspective; the special issues of management, training, and prevention; and a section on research prospects and an assessment of future direction of the field. (Author/LS)

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handbook on drug abuse

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Foreword

Today, when drug abuse professionals attempt to update their knowledge of the field, they confront a situation unknown to us 10 years ago—an abundance of solid research available in a wide variety of journals and monographs. The issue then becomes one of choice. Which articles are most relevant to planning prevention programing or managing local treatment units, and just as critical, which materials are the policymaker, clinician, or community organizer most likely to find both useful and understandable?

The second question is particularly important because as the field has both developed new techniques and utilized effective strategies from long established disciplines, its vocabulary has expanded and become more complex. While undeniably useful to the field as a whole, this new eclecticism does pose a special problem for the concerned professional who may not share a common knowledge base or research tradition with a published colleague. Thus, although goals are shared, the vital language to communicate findings—and the clinical implications of findings—may not be. As a result of this diffusion of effort, much relevant research is apparently not being disseminated to the field in a concise, understandable form, and research findings are not having an effect on clinical practice as rapidly as would seem desirable. When I discussed this problem with Dr. Barry S. Brown, Chief of the Services Research Branch of NIDA in late 1977, we decided that a compilation of recent research findings written in a style understandable to planners, clinicians, and policymakers was badly needed.

It was agreed that the Office of Drug Abuse Policy in the Executive Office of the President and the National Institute on Drug Abuse of the Department of Health, Education, and Welfare, would jointly sponsor such a publication with the Office of Drug Abuse Policy providing the needed financial support. Chapters would be commissioned from researchers and clinicians recognized by their peers as experts in one or another aspect of drug abuse. Our goal was to make available to the field a concise compilation of major developments of recent years and their implications for treatment and research.

We contracted with over 40 authors, all well known and respected in their fields, and I believe we have met that goal. During the drafting process, the editors commented on the interpretations of the research, but each author was free to incorporate as much or as little of the editors' comments as the individual author chose. Thus, the authors were free to express their viewpoints and interpretations of issues. In addition, many authors included recommendations for the future, including policy recommendations, and these too reflect the authors' thinking.

The handbook is organized into nine sections which cover issues ranging from the history of the field by Dr. Jaffe, to innovative treatment for drug addiction by Dr. O'Brien and Dr. Ng. Special attention has been given to the issue of treatment, which is discussed in chapters on the established modalities of treatment for narcotic addicts and studies of their effectiveness; in those describing ancillary treatment programs; and in chapters on specific populations such as youth, women, the elderly, and minority communities.

A separate section of the book is devoted to specific drugs or classes of drugs, such as PCP and amphetamines, which have aroused public concern in the past few years. One section looks at drug use from a psychosocial perspective, while another assumes an epidemiological viewpoint. Management, training, and prevention are discussed as special issues. The final section discusses research prospects and concludes with an assessment of the future direction of the drug abuse field.

6

FOREWORD

Taken together, these chapters present a comprehensive understanding of our research and treatment efforts and, perhaps more important, propose new directions in which we can proceed. I believe that this book will fill a critical need among professionals in the field of drug abuse prevention and treatment and that it will be widely acclaimed for years to come.

Lee I. Dogoloff
Associate Director for Drug Policy
Domestic Policy Staff
The White House

Preface

Lee Dogoloff's foreword describes the concept and design of this handbook. A word should be added on how it came to fruition.

Authors had been told that the intention was to make available to those in the drug abuse field a concise compilation of major developments of recent years, and their implications. Each chapter was to review briefly highlights from the past 5 years (more if indicated) of research and program initiative. Each was to be only 5 to 10 printed pages in length and was to include brief sections on implications for further research, for treatment, for prevention, and for training, unless one or more of these was not relevant. The original timetable called for first drafts of the chapters by the end of 1977 and publication in the spring of 1978.

This timetable was not kept, as the date of publication indicates. As is usual in any project, there were many unforeseen difficulties. Gaps in coverage were identified and new chapters commissioned. Some authors, because of prior commitments of time or other problems, could not meet their deadlines. Some chapters, in the judgment of the editors, required extensive revision, in several instances because the first draft was seen as too technical and not properly designed for the intended general audience.

Two types of editorial decisions deserve comment. First is the point made by Lee Dogoloff on interpretation of data and policy recommendations. The second type of decision relates to the content and depth of the chapters. Some authors held themselves to the original instructions, for example, with regard to length, and therefore had limited space to cover their assignments, necessarily omitting details. Others aimed at fuller coverage, regardless of restrictions, and exceeded the requested length. In a few cases, there was so little firmly established information in an assigned area that the authors could not say much even in a brief chapter. Aside from cutting extraneous material and material covered in other chapters, the editors chose to let chapters stand as written or as revised.

For this reason, and probably for other reasons too, the substantive coverage contained in the chapters in this handbook is somewhat uneven in the opinion of the editors. Many of the chapters are clearly superb—masterly reviews of what is known, judicious evaluations of research, with wise and practical suggestions for future directions in research, treatment, and prevention. We agree with Dogoloff that they will be widely cited for years to come. Most of the other chapters are at least competent and useful overviews of their areas, and thus achieve the original goal of the handbook. A few, in the frank opinion of the editors, are included with some misgivings, on the grounds that partial coverage of an area is preferable to omitting it entirely, and that seeking replacement authors would have delayed publication too long.

Readers will probably find that their major interests center on only a few of the sections, but most will find material of value throughout the book.

Contents

page

FOREWORD iii

PREFACE v

OVERVIEW OF DRUG TREATMENT

1. THE SWINGING PENDULUM: THE TREATMENT OF DRUG USERS IN AMERICA
   Jerome H. Jaffe, M.D. 3

TREATMENT MODALITIES FOR NARCOTIC ADDICTS

2. DETOXIFICATION TREATMENT OF NARCOTIC ADDICTS
   Robert G. Newman, M.D. 21
3. OUTPATIENT DRUG-FREE TREATMENT
   Herbert D. Kleber, M.D., and Frank Slobetz 31
4. THERAPEUTIC COMMUNITIES
   George De Leon, Ph.D., and Mitchell S. Rosenthal, M.D. 39
5. CLINICAL ASPECTS OF METHADONE MAINTENANCE TREATMENT
   Joyce H. Lowinson, M.D., and Robert B. Millman, M.D. 49
6. METHADONE IN TREATMENT: PHYSIOLOGICAL AND PHARMACOLOGICAL ISSUES
   Mary Jeanne Kreek, M.D. 57
7. THE USE OF LAAM IN TREATMENT
   Walter Ling, M.D., and Jack D. Blaine, M.D. 87
8. TREATMENT OF OPIOID DEPENDENCE WITH NARCOTIC ANTAGONISTS: A REVIEW AND COMMENTARY
   Richard B. Resnick, M.D., Elaine Schuyten-Resnick, M.S.W., and Arnold M. Washton, Ph.D. 97
9. TREATMENT EFFECTIVENESS
   S. B. Sells, Ph.D. 105

TREATMENT METHODS FOR SPECIFIC NEEDS

10. WOMEN IN TREATMENT
    Loretta P. Finnegan, M.D. 121
11. FAMILY TREATMENT OF DRUG PROBLEMS: A REVIEW
    M. Duncan Stanton, Ph.D. 133
12. TREATMENT OF THE POLYDRUG ABUSER
    Donald R. Wesson, M.D., and David E. Smith, M.D. 151
13. VOCATIONAL REHABILITATION
    Eileen Wolkstein, M.A., and Deborah Hastings-Black 159
14. AFTERCARE IN DRUG ABUSE PROGRAMING
    Barry S. Brown, Ph.D., and Rebecca Sager Ashery, D.S.W. 165
15. DRUG AND ALCOHOL TREATMENT
    Barry Stimmel, M.D. 175
16. JOB-BASED ALCOHOL AND DRUG ABUSE PROGRAMS: RECENT PROGRAM DEVELOPMENTS AND RESEARCH
    Harrison M. Trice, Ph.D. 181

CONTENTS (Continued)

page

17. INNOVATIVE TREATMENTS FOR DRUG ADDICTION
Charles P. O'Brien, M.D., Ph.D., and Lorenz K. Y. Ng, M.D. 193

18. CRIMINAL JUSTICE CLIENTS
William H. McGlothlin, Ph.D. 203

DRUGS OF RECENT PUBLIC CONCERN

19. INHALANTS
Sidney Cohen, M.D. 213

20. AMPHETAMINES/ANORECTICS
Everett H. Ellinwood, Jr., M.D. 221

21. THE ABUSE OF BARBITURATES AND OTHER SEDATIVE-HYPNOTICS
David E. Smith, M.D., Donald R. Wesson, M.D., and Richard B. Seymour, M.A. 233

22. COCAINE
Lester Grinspoon, M.D. and James B. Bakalar, J.D. 241

23. THE ENIGMA OF PCP
Stephen M. Pittel, Ph.D., and Mary C. Oppedahl 249

DRUG PROBLEMS IN SPECIFIC POPULATIONS

24. YOUTHFUL DRUG USE
Richard Blum, Ph.D., and Louise Richards, Ph.D. 257

25. DRUG MISUSE BY THE ELDERLY
Carl Eisdorfer, Ph.D., M.D., and Michele M. Basen, M.P.A. 271

26. DEPRESSION IN NARCOTIC ADDICTS
QUITE POSSIBLY MORE THAN A CHANCE ASSOCIATION
George E. Woody, M.D., and Jack Blaine, M.D. 277

27. DRUG ABUSE AND DRUG PROGRAMS IN RURAL AMERICA
Kenneth L. Nyberg, Ph.D. 287

28. THE DRUG ABUSE INDUSTRY AND THE "MINORITY" COMMUNITIES:
TIME FOR CHANGE
Frank Espada 293

PSYCHOSOCIAL STUDIES OF DRUG USERS

29. NONADDICTIVE OPIATE USE
Norman E. Zinberg, M.D. 303

30. ETIOLOGICAL ASPECTS OF DRUG ABUSE
David N. Nurco, D.S.W. 315

31. ADDICT CAREERS
Lee N. Robins, Ph.D. 325

32. MARIHUANA: A REVIEW OF RECENT PSYCHOSOCIAL RESEARCH
Richard Jessor, Ph.D. 337

33. DRUGS AND CRIME
William H. McGlothlin, Ph.D. 357

EPIDEMIOLOGICAL STUDIES

34. AN INTERNATIONAL OVERVIEW–
THE TREATMENT OF DRUG ABUSERS
John C. Ball, Ph.D. 367

CONTENTS (Continued)

page

35. INTERNATIONAL ISSUES–EPIDEMIOLOGY
Patrick H. Hughes, M.D. 373

36. SAMPLE SURVEYS OF DRUG ABUSE
Hugh J. Parry, Ph.D. 381

37. INCIDENCE AND PREVALENCE OF DRUG USE AND ABUSE
Leon Gibson Hunt 395

SPECIAL ISSUES

38. PROGRAM MANAGEMENT
MAGICAL EXPECTATIONS AND HARSH REALITIES
David A. Deitch, Ph.D. 409

39. DEVELOPMENTS IN TRAINING
Robert F. Dendy, Ph.D. 415

40. PREVENTION ISSUES
John D. Swisher, Ph.D. 423

DRUG TREATMENT IN THE FUTURE

41. RECENT ADVANCES IN BASIC RESEARCH RELEVANT TO DRUG ABUSE
Avram Goldstein, M.D. 439

42. THE FUTURE OF DRUG ABUSE PREVENTION
Robert L. DuPont, M.D. 447

overview of drug treatment

This book will try to summarize what is known and what is being done in the field of drug abuse today. But we begin with a review of the past—how did we arrive where we presently are?

It is fitting that this review be written by Dr. Jerome Jaffe. He has been active in the field through his entire professional career, and a leader in it most of that time. His residency in psychiatry was at the Public Health Service Hospital for addicts in Lexington, Kentucky. Later he did research and treatment in New York, and was the first head of the Illinois treatment program. He became a White House consultant to design a program for the heroin problem among the military in Vietnam, and then the first Director of the White House Special Action Office for Drug Abuse Prevention.

Dr. Jaffe is the author of the chapters "Narcotic Analgesics" and "Drug Addiction and Drug Abuse" in the widely used Goodman and Gilman Pharmacological Basis of Therapeutics, and of many papers in scientific journals. At the Special Action Office he was responsible for initiating much research on drug abuse, which continues as the responsibility of the National Institute on Drug Abuse. He also directed the first large expansion of treatment programs in the country, including the widespread use of methadone maintenance.

Dr. Jaffe is now with the Department of Psychiatry at Columbia University's College of Physicians and Surgeons, where he is active in research in psychopharmacology and drug dependence, with use of tobacco one of his major current interests.

7

1. The Swinging Pendulum: The Treatment of Drug Users in America

Jerome H. Jaffe, M.D.

Department of Psychiatry
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The American response to the use of drugs and alcohol has not always included treatment. At the time the Constitution was being drafted, drinking and drunkenness were all too common. Most colonials believed that daily drinking was necessary for good health. Employers provided their employees with rum which was consumed during the work day. Both Washington and Jefferson expressed concern about drunkenness and the consumption of distilled spirits, and each at one time advocated a switch to other beverages (wine and beer) to reduce the level of drunkenness.

The problem of drunkenness with all its attendant ills of sickness, decreased productivity, fighting, and crime had been a matter of considerable public debate for some time, but it was viewed largely in moral terms, and the drunkard was the concern of the law and of the clergy. It is Benjamin Rush, the eminent physician and signer of the Declaration of Independence, who is given credit for bringing a clinical perspective to the problem of excessive drinking in the United States, and for proposing that the drunkard may be less than a totally voluntary sinner (Levine 1978). Rush's introduction of the concept of a compulsion to use alcohol (craving) and of the progressive development of a disordered pattern of drinking began the process of modifying the exclusively moralistic view of excessive drinking. It also helped to accelerate the Temperance Movement, which in its early stages was opposed to the consumption of distilled spirits, but not to all forms of alcohol. By the mid-1830s, the notion of the desire for alcohol as an overpowering feeling was gaining proponents, and by 1838 Woodward, the superintendent of the asylum at Worcester, Massachusetts, described the chronic alcohol user as suffering from a "physical disease" (Levine 1978).

By the middle of the 19th century, the problems of chronic opiate use and tobacco use also came to be viewed, especially by those in the Temperance Movement, as in some ways analogous to drunkenness, simultaneously representing moral weakness and disease. Over the next several decades, public concern about opiate use continued to mount. The Temperance Movement adoped the position that since the use of any drug eventually led to enslavement, the only acceptable moral behavior was to avoid the drugs entirely. "Temperance" came to mean not temperate or moderate use, but total abstinence, and drug use outside of the medical context was seen as immoral. Somehow, the idea that alcohol was an inherently addicting substance fell into disfavor and, except in the Temperance Movement, was replaced by the view that alcohol was addicting only for those predisposed or vulnerable. Opium, on the other hand, came to be seen as being inherently addicting. At the same time, the medical profession was taking more interest in the problems of drug dependence and the changing terminology was beginning to reflect this interest. For example, the words "alcoholic" and "inebriate" were beginning to replace the word "drunkard." Chronic opium users were referred to as "opium habitues" and "opium inebriates," and the word "addict" was applied to chronic users of alcohol, as well as of morphine. While cocaine, paraldehyde, and chloral hydrate dependence had already been observed, many of the drugs that now cause concern (barbiturates, amphetamines, benzodiazepines) had not been introduced. The major areas of medical concern were excessive use of alcohol and opiates.

THE EVOLUTION OF TREATMENT FOR OPIATE DEPENDENCE

In their classic monograph on opiate use, Terry and Pellens (1928) documented the changing views of American and European clinicans over the 50 year period ending in the 1920s. In the beginning of that period of time, the focus was on the management of the opiate withdrawal syndrome, but there were still overtones of moralism. By the end of that period, it was clear that a substantial number of clinicans viewed opiate dependence as a clinical syndrome, rather than as the manifestation of a moral deficit, a syndrome which required attention to the period of convalescence that follows acute withdrawal. This realistic assessment of the need for an overall approach has rarely been summarized better than in the 1926 report of the Committee on Morphine and Heroin Addiction of the Ministry of Health of Great Britain.

> It was specially insisted upon by several witnesses that the actual withdrawal of the drug of addiction must be looked upon merely as the first stage of treatment, if a complete and permanent cure is to be looked for. As one witness put it, the real gain to the patient by withdrawal of the drug is to enable him to make a fresh start in new and more favorable circumstances, and little more than that can be expected from the actual treatment itself, whatever the method employed. A permanent cure will depend in no small measure upon the after-education of the patient's will power, and a gradual consequent change in his mental outlook. To this end it was regarded as essential by one witness that full use should be made of psychotherapeutic methods, both during the period of treatment and in the re-education of the patient. It was not considered that a lasting cure could be claimed unless the addict had remained free from his craving for a considerable period—1½ to 3 years—after the final withdrawal of the drug. Scarcely less important than psychotherapy and education of the will is the improvement of the social conditions of the patient, and one physician informed us that he made it a practice, wherever possible, to supplement his treatment by referring the case to some Social Service Agency. It was also regarded as important that the physician in charge of the case should, while the patient is under his care, make a thorough study of the causes, pathological and other, which originally led the patient to take drugs, and try to remedy them. Pain, insomnia or other physical malady must be suitably treated before the patient is released from observation.
>
> Prognosis
>
> Evidence we have received from most of the witnesses forbids any sanguine estimate as to the proportion of permanent cures which may be looked for from any method of treatment, however thorough. Relapse, sooner or later appears to be the rule, and permanent cure the exception. With two exceptions, the most optimistic observers did not claim a higher percentage of lasting cures than from 15 to 20 percent . . .
>
> While therefore, the ultimate outlook in any individual case is always serious it can by no means be considered hopeless and every effort should be made by thorough and suitable treatment to free the patient from his addiction. It must be borne in mind, however, that those witnesses who were most sanguine as to the proportion of permanent cures that could be obtained under the best possible treatment, recognized that the results they described could only be secured by treatment in institutions. Looking to the small number of such institutions in this country, as well as the cost of the treatment which, reasonable as it usually is, is beyond the means of some of the patients, and the impossibility under the law as it stands, of compelling persons suffering from addiction to become inmates of institutions, it is clear that under present conditions there must be a certain number of persons who cannot be adequately treated, and whom it is impossible completely to deprive of morphine which is necessary to them for no other reason than the relief of conditions due to their addiction . . .
>
> —Ministry of Health Report,
> cited in Terry and Pellens (1928)

Musto (1973) has described in detail the brief period of publicly supported treatment for opiate addiction in the United States in the opening decades of the 20th century and the subsequent shift away from the interest in treatment, a shift which seemed to coincide with an outpouring of moral fervor against the use of all drugs. By 1923, the last of the clinics that had been established to provide opiates to opiate addicts was closed. Opiate addiction came to be viewed as a threat to the "fabric of society," and preventing dependence by controlling the availability of "narcotic" drugs was seen as the highest priority. Deterrrence of use by the enforcement of criminal penalties became a major strategy. Physicians were not encouraged to attempt to treat opiate addiction.

THE SUBSEQUENT 40 YEARS

In terms of the treatment of opiate dependence in the United States, the years between 1925 and the end of the Second World War were relatively quiescent. Partly in response to the growing number of opiate addicts in Federal prisons, Federal hospitals were established at Lexington, Kentucky and Ft. Worth, Texas. Treatment was also available in some State mental hospitals and in private sanatoria. There were some sporadic efforts to treat selected opiate addicts with the newly developing techniques of psychoanalysis and psychotherapy, usually with little success (Conrad 1977). For the most part, however, heroin addicts remained outside the mainstream of psychiatry and medicine, and were decidedly unwelcome at most doctors' offices and hospital emergency rooms.

The process by which "narcotics addiction" (opiates and cocaine) came to be separated from alcoholism and nonnarcotic dependence, following World War I, is not entirely clear. Although the first reports of chronic barbiturate intoxication appeared within a decade of the introduction of the drugs in the early 1900s, it was not until the late 1920s that their "habit forming" potential was more widely appreciated. However, apart from labeling the drugs as habit forming, governmental efforts to directly control the availability of the barbiturates did not occur until the 1960s. Again, for reasons that are not entirely clear, a "holy war" against barbiturate dependence did not break out; treatment of barbiturate dependence by detoxification remained within the mainstream of medicine. Barbiturate-dependent individuals were able to maintain themselves as outpatients by obtaining supplies from medical channels, or to seek detoxification as they and their physicians saw fit. Dependence on chloral hydrate and paraldehyde, both of which had been available prior to the introduction of barbiturates, declined when barbiturates were introduced. When the nonbarbiturate sedative-hypnotics were introduced, each in their turn in the 1950s, they were seen at first as improvements upon barbiturates, then simply as alternatives to barbiturates. The observation that dependence could develop with the use of these drugs as well as with barbiturates elicited no outburst of public concern.

Similarly, amphetamines were not introduced into medicine until the 1930s, and although the phenomenon of habitual use was recognized by the 1940s, a full appreciation of their dependence potential did not come about until the 1960s. Formal Federal efforts to regulate the availability of amphetamines did not come until the mid-1960s, and amphetamine dependence, like sedative-hypnotic dependence, was managed by outpatient maintenance or inpatient withdrawal.

Thus, officially, only individuals dependent on drugs controlled by Federal statutes—opiates, cocaine, marihuana—could be admitted to the Federal hospitals at Lexington and Ft. Worth. An individual severely dependent on barbiturates alone could not be admitted, although an individual who wanted "treatment" for his/her marihuana use could be. In many parts of the country, a reciprocal bias existed at medical treatment facilities. Individuals with opiate problems would be turned away, while those with sedative or stimulant problems would be admitted.

A resurgence of interest in the treatment of drug dependence (especially of opiate dependence) began after World War II and built up slowly in the decade of the 1950s as clinicians in large urban areas began to encounter many young heroin addicts. In New York and Chicago, pilot treatment projects were initiated in the 1950s. Interest began to grow more rapidly in the early 1960s in apparent response to the increasing number of heroin users and the seemingly parallel increases in crime in cities like New York. Some idea of the rapidity of the growth can be gauged from a 1968 national survey conducted for the National Institute of Mental Health by the Institute of Behavioral Research at Texas Christian University. The goal of the survey was to identify "every organization that conducted a program specifically focussed on the treatment of drug addiction." One hundred eighty-three programs were located, most of them in New York, California, Illinois, Massachusetts, Connecticut, and New Jersey. They included facilities operated by Federal, State, and local governments, as well as by private groups. Of those responding, only two had been in operation for more than 20 years (the U.S. Public Health Service Hospitals at Lexington and Ft. Worth), and 77 percent had been operating less than 5 years (Glasscote et al. 1972). Detoxification programs were established in New York City, and Riverside Hospital, once used in connection with treatment in the 1920s, was reopened (1952) as a long-term treatment center for adolescent drug users on the assumption that the problem could be treated better if treated earlier. White House conferences were held; California and New York established large-scale treatment programs. One measure of the continuing ambivalence about the nature of the syndrome was that the California Department of Corrections was directed to operate the newly established compulsory residential program, while in New York, which in the mid-1960s also opted for a civil commitment program, a separate commission was created.

As State and local efforts to expand treatment were taking place, followup studies of addicts treated at Lexington and at Riverside Hospital were making it apparent that almost all heroin addicts treated at such facilities relapsed within the first year after leaving treatment. These findings did not lead to as much pessimism as they might have under other circumstances.

The early 1960s were also marked by a new phenomenon—the emergence of the professional ex-addict and self-regulating community. In 1958, Charles (Chuck) Dederich, a former alcoholic, established Synanon, a residential facility in Santa Monica, California, which not only admitted heroin addicts but also demonstrated that they could remain abstinent, productive, and self-governing without professional help. Vigorously refusing Government funds and associated accounting procedures as inimical to its methods, Synanon obtained its support from individuals, from the business world, and by providing products and services. From the beginning it made extensive use of public relations techniques. Highly critical of other approaches to the treatment of heroin addiction, Synanon established outposts in other cities. More importantly, in seeking financial support, the organization members fanned out across the country as visible symbols that heroin addicts could behave as responsible, productive, and law abiding citizens.

Influenced by Synanon, New York State and New York City encouraged a wider range of treatment approaches, including therapeutic communities and detoxification programs. With the help of David Deitch, a former heroin addict who had been at Synanon, New York State established Daytop Village and was able to demonstrate that the Synanon model could work, even if government support did require a set of books that could be audited. With somewhat less enthusiasm, New York State and New York City also supported the methadone maintenance program that was just being developed by Dole and Nyswander in 1964. Later, Martin et al. (1966) described their work with cyclazocine, a long-acting narcotic antagonist, and proposed that the antagonists might make an important contribution to the treatment of dependence on opiate drugs.

In 1966, Congress passed legislation establishing a Federal civil commitment program for opiate users, but it also increased support for community-based voluntary treatment programs. The period from 1966 to 1971 saw continued growth in the numbers of treatment programs funded by private solicitation, State and local governments, as well as by grants from more than half a dozen Federal agencies, each operating under its own congressional mandate.

The expansion of Federal support differed from previous efforts in that it was no longer specifically aimed at heroin and other narcotics, but also recognized that drug problems could be associated with a number of different drugs. This expansion also coincided with the sharp rise in marihuana use among middle-class young people, as well as with a period of mass-media preoccupation with the drug-using counterculture. It is clear from the testimony surrounding the various programmatic initiatives of the mid-1960s at the State and the local, as well as the Federal level, that concern with the "drug problem" was fueled by two distinct concerns: illicit drug use (marihuana, LSD) and nontraditional behavior among young people, and a continuing belief that heroin use was linked with the rising crime rate. While no formal statements were made proclaiming that the new programs were not intended to focus on the problems of tranquilizer abuse or alcoholism, the thrust was clearly directed at the use of illicit drugs by young people, and at those forms of drug use which might be related to street crime.

Support for treatment reached its apex in June of 1971 when President Nixon created by Executive Order the Special Action Office for Drug Abuse Prevention within the Executive Office of the President. Although the same presidential initiative also carried a recommendation for additional support for increased efforts to control the availability of illicit drugs and was accompanied by the dramatic labeling of drug abuse as "Public Enemy Number One," its implications as a landmark in the area of treatment should not be minimized. For the first time in the history of the Nation there was an explicit commitment to make treatment readily available.

In addition to increased funding for treatment programs, there were at least two other policy changes that are worthy of note. As Commander-in-Chief of the Armed Services, the President, in a memorandum to the Secretary of Defense, directed that drug use per se would no longer be a court-martial offense, thus changing the exclusively disciplinary policy concerning drugs that had prevailed in the Armed Forces over the preceding century. This was a humanitarian gesture, but it was also a pragmatic necessity, given the widespread use of heroin among military personnel in Vietnam. It was only in this way that urine tests could be employed to detect and deter opiate use and to bring users into treatment. In addition, there was a very explicit statement of the need to evaluate the effects of treatment and to gather information on the epidemiology of drug abuse.

While there undoubtedly were many legislators, judges, clinicians, and public spirited individuals who supported the expansion of treatment on the basis of humanitarian concerns, the outpouring of concern for treatment did not appear to stem from some profound public empathy for the heroin addict, but rather from the belief that heroin addicts committed crimes and created other addicts—especially at-risk youth—and that the capacity of the law enforcement system to contain the growth of the problem was no longer adequate. Treatment was supported primarily because clinicans claimed—and many nonclinicians believed—that treatment would reduce the number of crimes committed by addicts. This was certainly the basis for the substantial expansion of Federal activities initiated by the Nixon administration in 1971 and given a degree of permanence by the Drug Abuse Office and Treatment Act of 1972.

The admixture of concern and societal self-interest was articulated in a summary statement of policy by the first director of the Special Action Office: "to make treatment so available that no one could say he committed a crime because he couldn't get treatment." The purpose of stating the policy in this way was to convey simultaneously the belief that not all addicts commit crimes merely because they can't get treatment, but that when treatment is not available, society cannot easily distinguish between those for whom crime is one element of a lifestyle and those whose crimes are due, in part, to society's way of controlling drug availability. The message was that treatment ought to be available and might help some addicts lead law-abiding and productive lives; that with ready access to treatment, those drug users who continued to engage in crime might be more readily recognized as chronic criminals to be dealt with as such, rather than as victims of a policy of restricting availability.

The subsequent expansion of treatment using a variety of approaches was not undertaken without misgivings. The evidence for the effectiveness of several of the alternative treatments for heroin addiction was far from convincing. For some approaches, such as simple detoxification, the evidence suggested that the effects were exceedingly short-lived; for others, such as outpatient counseling, there was no evidence at all that any useful change occurred. It is important to recognize that the notion of "evidence" is used here in its scientific sense that is, information which makes use of accepted scientific methods and controls to show a causal linkage between one event (intervention) and the subsequent events (the behavior of drug users). That some improvement occurred in terms of social adjustment and reduced drug use when people entered treatment was unquestioned.

While there may have been concern that there was inadequate treatment for alcoholism or for those who overused drugs prescribed by physicians, it was quite clear that the intent of the Federal effort to expand treatment facilities, in the early 1970s, was to reduce as much as possible the social costs of illicit drug use by making treatment more available to those drug users who had been largely excluded from the mainstream of medical care. Because the middle-class users of psychoactive drugs had been accommodated all along within traditional channels, the new programs were directed at narcotics users and drug-using youth.

The initial focus was on heroin addiction because, in addition to its linkage to crime and to the rapidly growing demand for treatment, there were new "technologies" for treating heroin users which offered some hope of being more than revolving doors. Therapeutic communities, although not especially popular among heroin addicts, did appear to produce greater change than had been associated with detoxification programs. Methadone maintenance programs, although controversial, seemed to reduce crime and increase productive behavior; they also seemed to be acceptable to thousands of addicts who had put themselves on waiting lists to enter such programs. The distinction between offering treatment to those who want it and forcing treatment on those who do not is an important one and is discussed in greater length later.

SOME OTHER INFLUENCES ON PRESENT APPROACHES

There were a number of ironic aspects to the expansion of treatment in 1971. It came about even while the proponents of various approaches were reaching new heights of mutual derogation and even as the tide of opinion was beginning to shift away from a belief in the value of most social action programs. Within the Federal Government the administrative machinery to manage the "War on Drug Abuse" was being built up just as the Office of Economic Opportunity—the machinery for the "War on Poverty"—was being dismantled. Undoubtedly, some of the angry criticisms of the medical orientation of the drug treatment effort stemmed from those who felt that it was being implemented at the expense of poverty programs.

Even within the medical-psychiatric community no overwhelming satisfaction was expressed. The general disillusionment with effectiveness of social-psychological programs had resulted in a curtailment of expenditures for community mental health programs and there was a general feeling that resources directed at specialized drug abuse treatment were being bled from resources that would have gone to expand the more traditional programs.

The bitter antagonism directed at the use of the synthetic opiate, methadone, had multiple origins. Some could be traced to the view that continued drug use was immoral. Other objections were based on the view that any focus on heroin use was inappropriately narrow, and on the belief that programs utilizing the maintenance approach would be under the aegis of medical institutions rather than social agencies or mental health organizations, or would not fully take into account the importance of psychological factors. Still others objected because they believed that this approach would divert public attention from the social conditions (unemployment, family breakdown, etc.) which were believed to foster drug use or heroin use. Some of the most bitter criticisms of the use of methadone came from proponents of the therapeutic community approach who took every opportunity to publicly proclaim that methadone maintenance was merely "substituting one addiction with another" —and a worse addiction, at that.

In general, at this time in the history of the treatment of heroin addiction, the proponents of any given approach were commonly critical, if not contemptuous, of any other approach. Proponents of the therapeutic communities criticized the poor record of detoxification and the demonstrated ineffectiveness of psychotherapy and derogated the importance of professional training. Those with professional credentials were critical of the undocumented claims of the therapeutic communities, and expressed concern about the damage that might be done by the harsh confrontational techniques used by untrained ex-addicts. They pointed out repeatedly that a very small percentage of addicts actually enter therapeutic communities and only a small percentage of those who enter remain for more than a few months. Professionals were equally critical of the undocumented claims of effectiveness of "drug-free" ambulatory programs operated largely by ex-addicts whose only claim to expertise was their own drug-using experience. Those who advocated the use of methadone were critical of both the detoxification and therapeutic community approaches. There were few who defended simple short-term detoxification programs, and the costs of compulsory treatment programs as well as skepticism about their value limited the number of supporters for this approach.

Since heroin use seemed most closely linked to crime, and because there was a technology to deal with it, the early expansion did focus on heroin addiction. Partly to placate concerns about such a focus, there was also a deliberate effort to initiate and expand nonmethadone approaches, innovative treatments, and special programs for those whose drug-dependence problems did not involve opiates. Separate chapters in this book are devoted to the results of these initiatives.

If the evidence about the effectiveness of some of the treatment programs for heroin use was scanty, information on the value of the newer approaches to the nonopiate-using population was virtually nonexistent. However, in the real world of publicly supported programs, the choices are rarely simple. It is often necessary to establish programs to determine their value, and this is done knowing full well that it may be impossible to end them no matter what the findings.

In short, our present network of treatment services has been shaped as much by recent political and moral forces as by scientific evidence and medical opinion; and it continues to be influenced by the complex American perspective about drug use, drunkenness, and addiction that has colored this area of human concern for the past 200 years. Now, existing side by side, (often in conflict, but more commonly adhering to a tacit agreement to mutual coexistence), are groups, all supposedly knowledgeable, which view the problem of drug use from very different perspectives: (1) as residing essentially within the individual and his/her attitudes toward life; (2) as residing in social conditions that create frustrations and deprivations and simultaneously fail to control access to dangerous drugs; (3) as residing in an interaction between the effects of certain drugs and the biology of the users—some of whom may have a special vulnerability to the effects of the drugs.

Each of these perspectives leads to very different approaches to the problems of drug misuse and dependence, ranging from detoxification to maintenance programs, and from efforts to extinguish conditioned withdrawal phenomena to efforts to restructure long-standing characterological patterns, from programs designed to modify mood and self-esteem, to efforts to impart vocational skills that could bring realistic satisfactions, from concerns with the availability of jobs to general attacks on the free-enterprise system and alleged racism in American society.

Such a system must be understood in terms of its origins as well as judged in terms of its results. What is remarkable about the system is that despite its philosophical and operational diversity it became committed to self-examination and to the exploration of new approaches. More detailed results of this process of self-examination are found in many of the chapters of this book. The evidence is overwhelming that while in treatment in a variety of programs, and for varying periods thereafter, a significant proportion of drug users exhibit substantial improvement in a number of areas: more job stability, less illicit drug use, and less antisocial behavior.[1] What is still at issue is not that change occurs, but rather the degree of change which can be attributed to the treatment process, and also which programs affect which individuals. Given the importance of the question and the efforts made to date, it may seem curious to a casual observer that we still cannot answer such questions with anything but the broadest of generalizations. But the question is more complex than it seems. The characteristics of the individual and the environment to which he returns have significant effects on the outcome of the treatment process. Among these characteristics are age, ethnicity, education, drug use history, previous history of criminality, family background, and family history of drug use or psychiatric disorder. Unless groups are carefully matched on all these variables (and perhaps on others about which we can only speculate at present) the outcome of treatment might be different even for seemingly identical treatment programs. Only an exceedingly powerful treatment effect (such as penicillin for pneumococcal pneumonia, or electroconvulsive therapy for endogenous depression) is able to override the effects of the characteristics that drug users bring to treatment and of the environments to which they return. It seems apparent that none of our available treatments can be so described.

Developing a better understanding of what current treatments can and cannot do, and for whom, will continue to be a major challenge for decades to come. In the process of making such evaluations, one caveat seems appropriate. It is entirely conceivable that a 20-year followup of heroin addicts (in terms of abstinence, alcoholism, jail, morbidity, and mortality) would reveal little differences in status between a cohort who had participated in current treatments and a comparable group which for some reason had not been given access to treatment. It would be tempting to use such data to infer that treatment was without impact. A similar inference might be made by examining the status of a cohort of high school students 100 years after graduation to show that neither family structure nor the quality of education has impact on outcome—all will be dead. It is the quality of the years that must be judged, as well as the status at a given point in time.

Current methods for evaluating treatment programs are beginning to give consideration even to these subtle but essential measurements. However, there are, at present, no formal ways to assess the impact and value of the *concept of treatment*.

TREATMENT AS A SYMBOL OF INTENT AND BELIEF

The messages which the existence of a network of treatment programs convey to the society as a whole may be as important as the impact of treatment programs on those who seek treatment. The first and most important of these is that people who have drug problems have not lost their membership in the family of man; nor are they necessarily without the potential for recovery. While the delivery of this message may seem unnecessary at present, this was not always the case. The notions of moral turpitude and incurability have been linked with problems of drug dependence for at least a century. Even now, public and professional attitudes toward alcoholism are an amalgam of contrasting, sometimes seemingly irreconcilable views: The alcoholic is both "sick" and "morally weak" (Trice and Roman 1972). The attitudes toward those who are dependent on opiates are a similar amalgam, with the element of moral defect in somewhat greater proportion.

The myth of incurability was fostered, in part, by the harshness of the official measures developed in the name of prevention (Kramer 1976). To some degree, the myth has been dispelled by the official investment in treatment and the official pronouncement that the availability of treatment is a necessary and appropriate aspect of public policy.

At one time, little distinction was made in governmental circles between opiate users and opiate addicts; it was assumed that for practical purposes these concepts were interchangeable. Scholars had all but despaired of persuading policymakers that there was, in fact, a very important distinction. Now, because treatment involves the utilization of resources, it has become inappropriate to respond to the use of drugs as if *use* were *dependence*. Thus, the distinction between use and dependence becomes both operational and official, and the myth of experimentation leading inevitably to dependence becomes less viable.

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[1] See W. H. McGlothlin's "Drugs and Crime," this volume; S. B. Sells' "Treatment Effectiveness," this volume.

The symbolic significance of treatment and its availability may actually have a greater impact on the lives of drug users than the impact of treatment itself on those who enter programs. Undoubtedly, the number of drug users is far greater than the number of those who seek treatment—whether the drug be alcohol, opiates, or any other substance. Some of these users may have drug-related problems, but apparently they are able to bring their lives under control without formal help (Cahalan et al. 1969; Robins 1973; O'Donnell et al. 1976; Robins, this volume). The major problem for such individuals is access to the rewards of the mainstream of society, access which is markedly reduced when society views any drug use as tantamount to dependence, and dependence as both an incurable disease and a manifestation of moral depravity. After 50 years of viewing all opiate users or addicts as depraved and incurable, those who controlled access to legitimate employment remained skeptical. It was only the very visible presence and performance of individuals who were self-admitted former opiate addicts working in drug programs and still later in the larger community that eroded the long-standing prejudices. These first pioneers were generally sponsored by treatment programs who vouched for their reliability. Their success made it possible for others who did not have such credentials to follow. Prejudice and skepticism are still present, the changes in attitudes that have occurred over the last few years have not made a history of drug use a badge of pride. However, there is now considerably less reluctance on the part of individuals, even the relatives of high elected officials, to reveal that they have had difficulties, and the changes have unquestionably made it easier for individuals and their families to seek guidance and treatment. The changes in attitude have also made finding employment less of a discouraging activity. Another message of the treatment system is that society expects the drug user to reenter the productive mainstream.

With the changes in attitude toward drug users and the availability of alternate dispositions, it became possible to soften the impact of heavy criminal penalties for the crime of drug possession. Although treatment was often an inappropriate disposition for nondependent individuals charged with drug possession, the costs to society and the individual are probably reduced when long prison sentences for simple possession are converted to probation and "treatment."

TREATMENT AS RESEARCH OPPORTUNITY

That treatment programs offer possibilities for research on the nature of drug dependence itself and on the factors which affect its course is self-evident; this has been discussed in greater detail elsewhere. Further, it seems unnecessary to emphasize that, given the state of the art, research on the basic syndrome and on the influence of treatment is not an option, but an essential aspect of any rational policy dealing with problems of drug use and dependence. But treatment programs also offer unique opportunities to understand other syndromes and behaviors that concern society. For example, it is obvious from a consideration of the forces which shaped the present treatment system that one central concern is the relationship between drug use and criminal activity. Admittedly, the relationship is not a simple one, and the evidence that current treatment efforts reduce criminal activity among drug users has been criticized (see McGlothlin, this volume; Austin and Lettieri 1976). The need for further research is unquestioned. Despite the evidence that there may be a genetic-biological component in sociopathy and criminality (Guze et al. 1967), few chronic criminals seek treatment for their antisocial behavior. While such individuals have long been studied by criminologists, there is currently a distinct bias against conducting biologically oriented research on prisoners or parolees. However, a substantial proportion of individuals with antisocial histories have problems with alcoholism and drug dependence. Treatment programs for drug dependence, especially those with strong medical or behavioral orientation are, therefore, in strategically important positions to explore the origins of this behavior. In gauging the value of such programs, their potential contribution to the more general problem of antisocial behavior should not be overlooked.

DRUG TREATMENT PROGRAMS AS MODELS FOR SERVICE DELIVERY

It is interesting to note that, despite their shortcomings, treatment programs for drug problems have created some useful models for delivering human and medical services. In contrast to other areas of medical care which evolved from the private practice/fee-for-service model and its expectations of brief illness, many forms of treatment for drug dependence evolved from grant-supported services and the expectation of chronicity. From such origins there developed the concepts of outpatient "slots" and residential "slots"—the capacity to render care to an "average patient" (or client) at any given time. Within this framework, program support was based on the projected utilization of capacity to deliver a given mix of services (outpatient, residential, etc.) to a population of clients, rather than a conglomerate of itemized individual services selected by the treator and rendered to the clients.

Since the support of public inpatient facilities had traditionally been based on the number of "beds occupied," this system was not a radical departure for residential or inpatient facilities. But it did represent a movement away from the payment per visit and per procedure model used to support the outpatient programs that evolved from the fee-for-service model which was adopted by the Medicaid and Medicare programs.

All approaches are subject to abuses, but the abuses are of different kinds. The "slot" model, like the "occupied bed-day" model for hospitals, motivates program administrators to keep slots filled. This, in turn, often leads to misutilization of resources, e.g., patients who might be discharged are retained in treatment. Patients who might need only brief counseling are enrolled in long-term programs. However, this model is a considerable advance over the grant-in-aid model which did not even attempt to link the level of service to the amount of funding. The latter approach created no incentives to utilize resources efficiently. This approach often resulted in the development of exceedingly extensive services with no effort to make certain that the services were used.

The "slot" model also appears to be less subject to abuse than the fee-for-service model in which third parties agree to pay for a long list of individual procedures rendered to a client. As the Medicaid program has discovered, such an arrangement is an invitation to overutilization, a process in which the patient is made to undergo a variety of tests and procedures which for many are of questionable value.

The drug abuse treatment system has also pioneered in utilizing the concept of residential facilities to render those services once delivered in far more structured and costly inpatient hospital units. This willingness to experiment with a reduction in the formalities that evolved from the care of the acutely ill medical patient has also permitted drug treatment programs to demonstrate the value of ex-patients and paraprofessionals as staff, long before their value was clear in other areas. These innovations have brought about sharp reductions in costs, as well as the involvement of personnel who are often uniquely qualified to demonstrate concern and empathy for those seeking treatment. But these advantages have come at a cost that is still difficult to estimate. Nonprofessionals sometimes appear to be more interested in the political aspects of maintaining public support for particular approaches or for specific groups than in the impact of such programs.

The nonprofessional and ex-drug users often have difficulty in accepting notions of population heterogeneity and of multiple causal factors. This difficulty all too often leads to a bias against differential diagnosis, to a strong resistence to the view that biological factors may play a role in drug dependence, and to vigorous opposition to the use of biologically based approaches to treatment. Because of these biases, some individuals whose alcoholism or drug dependence seems to be linked to affective disorders must choose between the potential benefits of AA programs or therapeutic communities and those of antidepressant medications. Perhaps such problems will be resolved as the field matures. As the Nation examines various proposals for national health insurance we might do well to consider the lessons learned by this relatively new sector of the human services delivery system.

TREATMENT AS PERSECUTION, SOCIAL CONTROL, AND SELF-PERPETUATING BUREAUCRACY

No commentary on treatment would be complete without some mention of the view that treatment is a form of persecution, that drug addicts have problems only because society does not make drugs freely available, and that those who provide treatment or who are involved in implementing policies controlling availability actively support the status quo in order to maintain their own positions (Szasz 1975). If only this rather paranoid view had some validity, society's problems might be considerably eased. We could eliminate most of our difficulties by making all drugs easily available. While it is patently obvious that such policies tend to increase the use and the problems associated with use of alcohol and tobacco, it is important to recognize that the principle is equally true for the opioids. Even when these drugs are cheap and easily available (as they are for physicians and nurses, or for those who grow opium), dependence can develop and adaptive behavior can deteriorate to the point where help is needed. Societies throughout the world have long been concerned about the loss of adaptive behavior as a result of drug use.

More recently, as societies have assumed responsibility for providing health care and support for the individual regardless of his or her productivity, they are beginning to give even more attention to the entire range of behaviors that cause impairment, from accidents and suicides to the use of drugs of all kinds, including alcohol and tobacco (Lalonde 1975, Knowles 1977). The most commonly discussed approaches to the use of drugs are those that limit availability of the substance or sharply raise the costs of use. History teaches that efforts to control availability exact their own costs, and that at some point attempts to circumvent controls emerge. In these circumstances an illicit traffic may develop with all of the attendant problems that such traffic brings. Some observers have confused the moralistic elements that often become entwined in such policies with the public health aspects of policies. Such confusion can then lead to proposals for an ultra-libertarian policy of easy availability of all drugs as an alternative to both the moralism and the legal difficulties that availability control appears to entail.

Another perspective from which to consider the merits of such an ultra-libertarian (Szaszian) view is to attempt to envision a world where all drugs are freely available at prices dictated solely by the costs of their production and distribution. Such a world would probably be one in which the responsible citizens would be found demanding that government take action to limit the availability of certain drugs in order to reduce the impact of drug use on health, accidents, productivity, and on the demand for the treatment of dependence. (The major sources of energy for the Temperance Movement were the women whose families were unsupported by husbands who drank easily available alcohol.) In all likelihood, the drugs for which regulation would be demanded would include all those that are currently regulated, and perhaps a few more.

A libertarian policy is not without problems and raises its own moral dilemmas. The issue of the user's self-sufficiency and means of support must still be addressed, even if drugs are so cheap that their cost is inconsequential. Should society provide support for those whose drug use renders them incapable of productive activity?—or for their families? Should it provide treatment for those who must give up drug use because they are not productive enough to use drugs and also support themselves? Assuming that drugs are inexpensive, but not free, would the denial of free drugs and free sustenance constitute a form of coercion into treatment? Would coercion into treatment exist to a greater extent if, as a matter of policy, a society were to tax drugs and thereby raise prices as we do for alcohol and tobacco? Or to raise prices still more by restricting availability to illicit channels? Within this framework, it is obvious that the concept of coercion into treatment is a matter of definition.

However, within an overall policy of discouragement of drug use and of availability control, there are a number of alternative means—from absolute prohibition with severe criminal penalties for use or possession, to legal access under conditions which deliberately raise the cost of use and maximize the likelihood that the user will be aware of the risks. Assigning the medical profession the task of deciding which drugs in which amounts may be used by which members of the society is somewhere between the extremes. In the United States, the attitudes toward this approach have varied over the past century and have always included a considerable degree of ambivalence. Over this period, legislatures have progressively restricted and delineated the conditions under which psychoactive drugs could be prescribed. (The only exceptions to this principle of progressive restriction were the repeal of prohibition and the policy change which made it legitimate to provide the opiate, methadone, to drug-dependent individuals under specified conditions.) It is clear that permitting limited supplies of any drug to drug users through medical channels is a separate policy question, one that cannot be answered without a thorough consideration of the specifics of each situation.

The relationship between policies concerning the availability of a given drug and the policies concerning treatment for people with problems associated with that drug is not fixed. Treatment and the kinds of treatment offered are options within an overall social framework which regulates the availability of and attitudes toward any given drug. Providing treatment is not a necessary part of a social policy of deterrence or limited drug availability. Indeed, a policy of deterrence through restricted availability would probably function even better in the absence of the treatment option (as when users were almost automatically convicted of the crime of possession), but the system is considerably more humane (even if less efficient) when treatment is available.

The question of whether individuals capable of self-support and not convicted of crimes should be coerced into treatment (except by the difficulties that drug using causes) is another matter entirely—and the discussion thus far is concerned primarily with "voluntary" rather than compulsory treatment. Involuntary institutionalization has been advocated as a setting for the treatment of drug use disorders, but more so in the past than at the present time. There are several reasons for its previous popularity and subsequent decline. In the early decades of this century involuntary commitment to mental institutions for a number of disorders was a rather common occurrence. It is understandable, then, that medical authorities discouraged by the reluctance of opiate users to seek detoxification, by their tendency to drop out of treatment prematurely, and by the rather high relapse rate even when successful detoxification was accomplished, would have recommended involuntary "commitment until cure." The idea that there was something antithetical to American ideals of personal liberty and freedom of choice in trying to force an individual to change his/her lifestyle does not seem to have received a great deal of attention.

When the Federal hospitals were operating between the 1930s and 1960s, a variety of devices were used to prevent addicts from leaving whenever they chose to do so. For the most part, this effort to gain control over the addict's behavior represented a belief that if the addict were unable to "act out" his anxiety and conflicts but could be made to face them in therapy, given enough time in treatment the prognosis for the future would be improved. The idea that commitment to treatment in an institution is also a useful way to keep sociopathic individuals off the streets did not emerge as a major reason for supporting compulsory treatment until the late 1950s and the early 1960s. It may be that as long as criminal penalties for possession of drugs, the rules of evidence, and other criminal justice procedures made it possible to put heroin users into jail almost at the will of the local police, the use of involuntary institutionalization as crime control strategy was neither needed nor efficient. Perhaps as a response to the increasing legal constraints on police methods of apprehending offenders, in general, or to the requirement that those arrested be afforded certain legal protections (or simply because its time had come), the idea emerged that compulsory institutional treatment of drug addicts might be an appropriate public response to the rising crime rate and the increasing use of illicit drugs.

This view was successfully translated into law in California in the early 1960s. The treatment program that evolved became part of the Department of Corrections. Within a few years New York also instituted a compulsory treatment program, and in 1966 the Federal government also established a civil commitment program. However, within less than a decade, all of these programs had been either phased out entirely or allowed to atrophy. The failure of these programs to survive was not because the public developed a new concern for the civil rights of heroin addicts, or because the long-term results of such programs (in terms of relapse) were more disappointing than the results of numerous detoxification and drug-free ambulatory programs. The compulsory programs fell victim primarily to their own escalating costs. For example, the cost of treating an addict for 6 months at the Lexington facility in 1971 was in excess of $20,000, and the cost of aftercare (about two visits per week) was nearly $4,000 per year. While the New York program was somewhat less expensive than the Federal, it was still prohibitively expensive as a practical response to a nationwide heroin epidemic that was estimated to involve hundreds of thousands of addicts.

There is little doubt that 6 months of institutional "treatment" of active addicts would have reduced crime rates for those in "treatment" and that the American public would have been willing to support legislation to create such programs. What they would not have been willing to support is the cost. At an annual cost of $25,000 per person for the first year, the entire 1974 Federal budget for treatment would have provided for the "care" of less than 10,000 addicts. Without support of compulsory programs in 1974, the Federal Government provided for treatment of almost 100,000 addicts at a given time.

TREATMENT AS A SOCIAL LUBRICANT

There is a long history of assigning an individual who has committed a crime to "treatment," rather than to the punishment described in the law. In the past decade the use of such assignment has undergone an incredible expansion. Part of the impetus for the increased utilization of treatment in lieu of punishment for drug offenses came from the view that the drug-dependent person had diminished capacity to control his/her own behavior and, therefore, the law, as applied to the mere user, or even to someone who had committed petty theft or forged a prescription, was overly harsh. The thesis was that but for the drug dependence the crime would not have occurred (a thesis now believed to have a very limited validity). A major paradox is that this view leads logically to the position that there is no comparable excuse for the experimenter who is not dependent, and thus, in contrast to the addict, the occasional user guilty of drug possession ought to bear the full responsibility of his or her behavior.

This position is made even more awkward by the fact that the occasional user of dependence-producing drugs is more likely to be young and, according to some, is therefore more likely to be hardened rather than deterred by imprisonment. The dependent user (if it were possible to distinguish between the two) is more likely to be older, and more likely to have already experienced imprisonment. In short, the use of treatment in lieu of punishment on the basis of diminished capacity creates as many problems as it attempts to solve.

Another impetus for the use of treatment as an alternative to punishment was a belief on the part of some judges, prosecutors, and correctional officials that the penalties for drug possession were too severe, and further that imprisonment and parole would have no lasting effect on the behavior. This view was associated with a belief, not vigorously opposed by clinicians, that the use of an illicit drug, even in the absence of dependence, was a manifestation of an "emotional problem," and that with psychological help from appropriate therapists or programs this problem could be resolved and the illicit drug use would cease.

Whether treatment ever was effective in eliminating drug use, as opposed to dependence, is a matter covered in detail in other chapters in this volume. A more relevant point is that in many instances the dramatic changes in social attitudes toward recreational drug use has made diversion into "treatment" an absurd parody of its original intent. One common form of diversion was to sentence people convicted of possession of marihuana or LSD to treatment instead of to jail, or to suspend prosecution provided the apprehended marihuana (or other drug) user entered and complied with the requirements of a treatment program. This use of treatment may have greased the gears of the criminal justice system, preventing it from grinding too cruelly those who were apprehended, but all too often the marihuana user was given lectures on drug use by treatment staff who saw no significant harm in marihuana or LSD use and whose own use may have been relatively recent. At one point, in the early 1970s, 15 to 20 percent of the capacity of federally funded treatment programs was occupied by individuals who listed marihuana as their "primary" drug problem. It is unlikely that very many of these individuals were such heavy marihuana users that impairment of health and productivity was their motive in seeking treatment.

There are some who see this use of treatment as an alternative to punishment as coercion into treatment, and as such it is as disturbing to some of the treaters as to the treated. There are others who see only the absurdity of the situation, the waste of treatment resources and the seeming hypocrisy of a society that appears to circumvent its own laws but is unwilling to change them. From a purely medical or scientific perspective, these criticisms have considerable validity. The decision to use a drug occasionally, even if the drug is not legally available, is not in and of itself a manifestation of a treatable disorder. But, here as elsewhere, we need to consider not only the costs of this apparent misutilization of treatment resources, but also whether the full utilization of the criminal justice system, as prescribed in the statutes, would not, on balance, be even more costly. We might also consider, in passing, whether there are not some potentially valuable aspects to the present drug control laws. As many former drug addicts and experienced therapists will testify, the seemingly coercive aspects of the criminal justice system and the limited availability of psychoactive drugs can be the external corrective forces that help the users make changes for which they and their families are grateful.

There is a reasonable probability that given an opportunity to legislate a balance between personal freedom and the risks of drug availability, we would find the variations of drug-using behavior simply too complex to be covered by any set of laws, and that in striving toward the concept of justice, we would build into our system a little "treatment" to lubricate the gears.

BEYOND COST-BENEFIT ANALYSIS

The facets of treatment that have been highlighted in the preceding pages are intended to provide some additional perspective from which our society's current approach to drug dependence may be viewed. Undoubtedly, there are other perspectives, some much more sanguine about the value of treatment for the individual and society, others considerably more skeptical and suspicious. Without question, there are activities in this field which, if judged solely in terms of their overall costs and the benefits provided to those treated are, at best, inefficient and, at worst, shamefully wasteful. Part of the problem is inherent in the American character. We prefer to believe that no problem is insoluble, that effort will eventually bring results, and that, in general, activity is better than inactivity. Thus, we created a diversified treatment system before there was evidence that any elements in that approach altered, over the long term, the natural course of behaviors which caused us concern. Having done so, should we be surprised that those who have devoted their careers to this system react strongly to the findings suggesting that drug-dependent people (whether alcoholics or opiate addicts) who enter treatment appear to do less well than those who stop spontaneously?[2] Those who provide treatment vigorously reject the inference that the high rate of "spontaneous" remission indicates that treatment has little impact on the natural course of events. Treaters prefer to believe that those who seek treatment are sicker than those who do not seek it and, therefore, would have fared even less well but for the availability of the treatment option. But the defense would lack vigor in the absence of data, and data are now emerging that support the contention that several types of treatment alter drug-using and criminal behavior beyond what might have been expected in the absence of treatment (McGlothlin et al. 1978; McGlothlin, this volume; Sells, this volume). Yet, it is still incumbent upon us to recognize the heterogeneity of the populations and the behaviors subsumed under the concept of drug abuse and dependence and to concede that some of the problem behaviors are, at best, only modestly affected by what we try to do. While a number of well-designed followup studies show that a substantial proportion of former patients are alive, not in jail, and not using illegal drugs, and are often working at legitimate jobs (see Robins, this volume; Sells, this volume), it remains difficult to demonstrate a causal relationship between treatment and the improved behavior noted at the followup. The task of demonstrating such a relationship is not impossible, but it is far more complex, costly and time consuming than was imagined in the heady days of the late 1960s when the system was expanding. If the public was led to believe that clear answers about effectiveness were in the offing, we should concede that our judgment on the matter was badly flawed. Judged by effort, compared to other areas of human service, the field deserves exceedingly high marks, and we should be pleased that we are now beginning to see the kinds of data required to show that treatment has impact and for whom. Yet, we are still far from knowing whether the magnitude of the difference in outcome for those so treated is worth the cost of the treatment.

Because of these uncertainties, it has been all too easy for some observers to view the entire effort to treat drug-dependent people as a form of featherbedding relatively useless activity, unlikely to be missed, and promoted by grantsmen, bureaucrats, and other assorted entrepreneurs. The "drug abuse-alcoholism treatment industry" must share the responsibility if the public accepts such a view. In order to gain support for programs, claims were made about successes that cannot be documented, and expectations were raised that cannot be fulfilled. Equally contributory to the negative image is the internicine warfare in which proponents of one treatment approach attack the results obtained by proponents of another. While this mutual recrimination is no longer as shrill as it once was, it has yet to mature into the constructive critical discussion which emphasizes the strengths rather than the shortcomings of each treatment approach.

An even more cynical (if not paranoid) view of treatment is that it is a political hoax foisted upon a gullible public for nefarious political reasons. Although such a view is totally without foundation, it becomes more popular as conservatism sweeps the country and taxpayers complain of the burdens and become disillusioned about the results of a wide range of social and medical programs.

In order to weigh the value of treatment, a rational society must also consider its alternatives. What would be the implications of declaring that treatment of drug dependence is not sufficiently effective to justify public support? Putting aside the economic dislocation of those who work in the treatment community (in a trillion dollar economy they would eventually be absorbed), let us focus exclusively on the messages that the abolition of treatment would convey. To the public it would say that drug dependence is either a disorder of the will power (read "moral defect") in which drugs are used because the users "love" the effects the drugs produce and can be controlled if only the individual will forswear the drug. (This is the message that Increase and Cotton Mather gave to their hard-drinking New England congregations in the 17th century.) Or, it would convey the message that the behavior may not be merely a problem of "will power," but that the difficulty is beyond our capacity to modify. For some, the latter view would lead to the 1920s position that given an unmodifiable syndrome, any measures, no matter how harsh, are justified in the name of prevention. Arrest and imprisonment of drug users who have committed no crimes other than possession of the drug they use becomes appropriate because it deters drug use by others, thereby preventing dependence. For others, the "unmodifiability" position leads to the view that free distribution of drugs is the best way to minimize the social cost. This view often ignores the possibility that the cost of careful distribution of drugs might exceed the cost of the present complex effort at treatment and prevention, and that even with care the increase in availability would increase the rate of drug use. Since it is quite probable that, in the absence of legislation to specifically abolish all treatment, the middle-class drug abuser will continue to find treatment in programs that do not receive categorical support as specialized drug treatment programs, another implication of the withdrawal of support for treatment is that only drug problems among the poor cannot be treated. To employers, the message that "treatment doesn't work" would mean that a history of drug dependence is a permanent handicap, and that an individual who develops a problem should be fired, not helped. To the drug user the message would be an invitation to delay seeking help and to hide problems for as long as possible. Since these are not pleasant alternatives to contemplate, we can assume that the concept of treatment is secure, even if the forms must change to accommodate changes in knowledge and shifting social priorities.

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[2] See L. N. Robins' "Addict Careers," this volume.

The availability of treatment for drug dependence is symbolic of a society's view of the human condition, of its view of the balance between personal liberty, the responsibilities of the individual to the state, of the state to its citizens, and of its willingness to seek ways to alleviate suffering. The nonavailability of treatment would also be symbolic. All too often when the benefits of the treatment effort are weighed, the policymakers forget to put the value of treatment as a symbol into the balance. The ultimate measure of the value of policies and programs is not the sum total of their effects minus their shortcomings, flaws, and abuses, but rather what alternative policies and programs might be developed which, when weighed in some balance that is sensitive to symbols as well as costs, would be better than that which now exists.

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treatment modalities for narcotic addicts

As of April 1977, there were more than 250,000 budgeted treatment slots for drug abuse patients in the United States, the bulk of them in the treatment modalities described in the eight chapters of this section. Sells' chapter on treatment effectiveness is included in this section because to date evaluations of treatment have focused on these modalities much more than on the kinds of treatment discussed in the next section.

It is clear, explicitly or implicitly, in each of the chapters that the goals of treatment differ to some extent from modality to modality, and readers will know that within modalities agencies differ in their goals, or in the relative weights they assign to goals. Sells recognizes these facts, and that in a sense it is therefore unfair to use the same outcome criteria to evaluate the effectiveness of different agencies and different modalities. It is equally obvious, however, that if different treatments are to be compared on effectiveness, as Sells does, they must all be measured by the same yardstick.

Among the outcome criteria used by Sells are drug use, employment, and criminality. These are included in the discussion of treatment goals by most of the authors in this section, specifically or implied under "rehabilitation," and have been the traditional outcome criteria used in prior evaluations. It is therefore of interest that the Task Panel on Psychoactive Drug Use/Misuse of the President's Commission on Mental Health characterized "goals such as elimination of drug use, reduced criminality and increased employment" as "false hopes and expectations which have been raised regarding treatment." (Report on the President's Commission on Mental Health, Vol. IV, Appendix, p. 2125).

The report was published after most of the authors in this volume had written their chapters, so they could not comment on it. It is appropriate that the editors should comment, since the position on treatment goals and other positions taken by the Task Panel will be widely disseminated and cited.

It is clear that the Panel disapproved of almost all current drug policies, but did not always make clear precisely what changes they advocate. They attempt to distinguish between drug use and misuse; the former "refers to a wide range and pattern of psychoactive drug consumption, while misuse refers to individual dysfunctions and societal harm which may result from such use" (p. 2108). Presumably what they meant to say was that misuse included those parts of the range or patterns of use which did, or were likely to, produce dysfunctions and harm. They go on: "The overwhelming majority of users of psychoactive drugs of all kinds—present little problem either to themselves or others" (p. 2110, emphasis added).

Marihuana should be completely decriminalized, and steps taken toward a legal production and distribution system, with regulation to provide standards of purity, quality and potency, though "intervening events and subsequent information may militate against adoption of any legal system of regulation and control." If marihuana decriminalization continues to be successful, it should be carefully evaluated "with the aim of considering a similar approach for other psychoactive substances" (p. 2117).

The Panel is highly critical of the drug treatment system as it has evolved over the past decade. They feel that many who do not need treatment are forced into it by policies which define all non-medical use of psychoactive drugs as misuse and requiring treatment, and that to a large extent treatment has become a method of social control by diversion from the criminal justice system. Under the policies they advocate, the need for treatment would be much less, perhaps only emergency room care for the "bad trips" of nonopiate users, with most treatment slots and funds reserved for those suffering from the dysfunctional effects of chronic and long-term use of opiates.

In such a situation, abstinence would not be a goal of treatment, since use would be accepted as no problem. It is less clear why employment would not be a goal of treatment, and therefore an appropriate criterion of success, since the Panel recognizes unemployment and lack of skills *as characteristic of most opiate users in treatment and as important concerns of their therapists. Similarly, they are not specific as to why decrease in criminality would not be an appropriate goal, but one may infer that they feel the association between opiate use and criminality would be much weaker under the new conditions; if criminal behavior is rarely an effect of drug use, one would not expect it to be affected by treatment of the drug use.*

Whether these proposals are wise, and whether there is any appreciable chance of their being accepted by the American public in the foreseeable future, are questions that need not be addressed here. What is clear is that they refer to a possible future state of affairs, and not to the past decade or the present. Whether one regards them as realistic goals or not, it is historical fact that public funding and other support of drug programs have been based on several assumptions: that treatment could and should aim at helping drug users to achieve abstinence, except for possible indefinite maintenance in some cases; that much crime is caused by drug use, and would be eliminated or reduced if the drug use is ended; and that most drug users who become abstinent would be more likely to remain so, and possibly more likely to become abstinent, if they could be helped to regular employment. It may well be that too much was expected of treatment along these lines, but the expectations were there, and thus furnish reasonable criteria for evaluating the effectiveness of treatment.

Whatever one may think of their proposals, the Panel does identify and discuss many problems with respect to treatment policies, and all of these are concerns of one or more chapters in this or following sections. Statements about numbers or proportions are more guesses or expressions of opinion and bias than they are estimates, but it is certain that some users of drugs, even of opiates, and more users of drugs such as marihuana, do not require any kind of treatment. It is beyond question that some problems of some users are more attributable to drug laws and drug policies than to the drugs. There is no doubt but that treatment methods which work reasonably well with patients who voluntarily enter treatment may be of dubious value for those who enter solely to avoid prison. Clinical and moral and legal considerations can and do become confused, and produce problems in the relationships between funding sources and treatment agencies, between administrators and treatment staff, and between staff and clients.

Some of the chapters that follow address one or two of these issues, and some address almost all of them. The authors are clearly not in full agreement with each other on the implicit assumptions they make, on their views of what the facts are or what they mean, nor on what should be done to improve the situation. This is probably as it should be. It is easy to forget how new the treatment system is, and that the "drug problem" has been changing while the system evolved to handle part of it. Consensus would be premature.

2. Detoxification Treatment of Narcotic Addicts

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INTRODUCTION

> The most straightforward way to help a heroin addict is to detoxify him . . .
>
> —DeLong 1972

Detoxification of narcotic addicts is highly successful, relatively cheap, applicable on a very large scale, associated with virtually no morbidity or mortality, and is acceptable to a very large proportion of the addict population, including those who are otherwise "unreachable." With the possible exception of safety, these attributes of detoxification treatment are in marked contrast to other modalities employed in the treatment of narcotic addiction. Nevertheless, detoxification, as a distinct treatment regimen, has enjoyed scant support from those who plan, fund, and operate treatment services for narcotic addicts in the United States and overseas. Indeed, virtually all references to this approach found in the professional literature are negative (Hunt and Odoroff 1962; Gay et al. 1971; Gudeman et al. 1972; Jonas et al. 1972; Canada 1972; Moffett et al. 1973; Silsby and Tennant 1974; Wilson et al. 1974; Tennant et al. 1975; Wilson et al. 1975).

In this chapter, the potential role of detoxification in the overall approach to addiction will be described, major programmatic issues discussed, and selected results of the largest detoxification program in the country presented.

DEFINING SUCCESS

> Too idealistic a therapeutic aim on the part of both therapist and patient may lead to mutual frustration and failure to accomplish anything.
>
> —Pattison 1966

Acknowledging Limitations

It has been claimed that ". . . Withdrawal is only the first and least important stop in the treatment of narcotic addiction" (Isbell and Vogel 1948). This statement implies, at the very least, that "treatment" must be directed toward permanent abstinence. More likely, although written 30 years ago, it embodies the currently popular holistic view that "success" in the treatment of narcotic addiction must be measured by patients' employment rates, dependence on public assistance, criminality, social relationships, and general physical and mental well-being—in addition to the elimination of illicit drug use. These broad criteria of therapeutic effectiveness, which are rarely applied to other medical conditions, probably reflect the fact that society, in paying the bill for addiction treatment, is motivated by self-interest no less than by altruistic concern for the addict. This is understandable, and since the benefits of patients and the general community overlap considerably, it presents little conflict for the clinical staff. However, to the extent that more limited goals are rejected, the diversity of therapeutic modalities inevitably is curtailed, to the detriment of both the addict and the nonaddict population.

Effectiveness of narcotic addiction treatment, regardless of modality and irrespective of the criteria used to measure success, has been shown consistently to vary directly with the duration of treatment (Cushman 1972; DeLong 1972; Gearing 1972; Johnson et al. 1973; Newman et al. 1973; Perkins and Bloch 1970; Sells et al. 1977). This is not surprising, since many addicts have a history of illicit drug use for many years before seeking admission. Furthermore, related factors such as employment, lack of education and skill-training, and criminality are frequently of even longer duration, and commonly antedate the onset of illicit drug use. Obviously, it would be naive to expect this constellation of problems to be corrected overnight! In the case of detoxification, which has been defined pragmatically as extending no more than 3 weeks (U.S. Department of Health, Education, and Welfare 1972), resolution of these problems is simply out of the question.

If long-term abstinence is viewed as a goal of a detoxification program, even as a secondary or tertiary goal, the results will inevitably lead to frustration and cynicism among the staff, which will in turn be perceived by the patients and have a strongly adverse impact on the program's operation. A small handful of patients will indeed achieve lasting abstinence after detoxification treatment, just as some addicts give up the use of narcotics with no treatment intervention whatever. Such cases, however, must be viewed by the staff as pure serendipity.

Detoxification: A Goal in Itself

> To succeed, you must add water to your wine, until there is no more wine.
>
> —Renard, c. 1900

Treatment must be evaluated with respect to predetermined objectives. If the usual criteria of success in the treatment of addiction are not applicable to detoxification, what objectives *are* relevant? First, and most basic, is the goal inherent in the very label "detoxification" the elimination of the acute physiological dependence which invariably is associated with chronic, daily use of narcotics. It is of course true that this can be achieved spontaneously with no treatment of any kind, in a matter of days following abrupt cessation of narcotic intake, but not without discomfort. The severity of this discomfort (i.e., the withdrawal syndrome) and the degree to which it is influenced by psychological as opposed to physiological factors, have been the subject of some debate, especially in light of the progressive decrease in purity of illicit narcotics available in most parts of the United States during recent years. This debate, however, is largely academic. It is well established that narcotic dependence *is* characterized by a physiological abstinence syndrome when the drug is withheld, in animals as well as in humans (Jaffe 1970). Furthermore, although experimental studies have confirmed the clinical impression that the signs and symptoms of withdrawal vary in intensity as a consequence of a multitude of intrinsic and extrinsic factors (Wikler and Pescor 1967; Nichols and Davis 1959), most addicts *do* seek to avoid "cold-turkey" withdrawal at all costs. Indeed, it is not unreasonable to conclude that for many addicts the continued use of illicit narcotics stems as much from a desire to avoid withdrawal, as from an attempt to gain euphoria, especially when a high degree of tolerance has been achieved (Lindesmith 1947).

Each Day of Treatment: A Goal in Itself

> Because of the addict's propensity to resume his habit, it is argued that progress in breaking the habit should be measured in man-hours or days off drugs.
>
> —Lindesmith 1968

In detoxification treatment, the primary objective is to provide symptomatic relief from the withdrawal syndrome while the body gradually adjusts to a drug-free state. In addition, however, there is an even more limited objective of detoxification treatment which is independent of the achievement of abstinence: namely, to provide during *each day* of treatment a safe, legal alternative to the self-administration of illicit drugs. By definition, this aim is achieved on the very first day of treatment, and on each subsequent day that the patient returns. The benefit to the individual addict is obvious, since each and every illicit dose of narcotics carries with it a risk of morbidity and mortality, and the criminal activity generally needed to procure each dose is associated with the possibility of arrest and incarceration. From the perspective of the community as well, there is a clear-cut benefit to reducing, even for a single day, the need of the addict to procure money with which to buy narcotics. When tens of thousands of addicts enroll in a detoxification program yearly, the impact on the community can be very substantial indeed, regardless of the proportion which remains for the full course of treatment.

The benefit to the public of a large-scale detoxification network is particularly evident when law enforcement efforts (or even such extraneous phenomena as a longshoremen's strike, as occurred in New York City in 1971) suddenly curtail the availability of illicit drugs. At such times, "panic" can ensue among the addict population, with sky-rocketing prices of drugs on the street and, presumably, an associated increase in crime. Generally, the long-term treatment program capacity is inadequate to accommodate the resultant demand for admission. Detoxification facilities, however, with considerably greater staffing flexibility and with a total turnover of patients every few weeks, can serve as an effective buffer. A similar role for detoxification clinics exists when a city (or country) embarks de novo on an effort to provide treatment to a large number of addicts. The speed with which staff can be recruited and trained, and facilities made operational, is far greater for detoxification programs than for any other modality.

Referral: A Secondary Objective

Objectives of a short-term detoxification program are not limited to preventing withdrawal symptoms and providing a temporary legal alternative to illicit drug use. Although it is naive to aim for persistent abstinence as an outcome of detoxification treatment per se, it is appropriate to seek to orient patients to long-term modalities, and to facilitate referral whenever possible. Some patients will enroll in a detoxification program preparatory to ambulatory or residential drug-free treatment. Many nonchemotherapeutic programs do not provide treatment for withdrawal symptoms, and encourage (or require) applicants to complete a brief course of detoxification prior to admission. More commonly, however, addicts who enter a detoxification program do so because, while they reject long-term treatment and are unwilling to make a commitment to give up their addiction, they do seek temporary relief from the hassles associated with the need to support constantly their dependence on narcotics. Despite the fact that these patients frequently acknowledge that their primary goal is merely to reduce their tolerance to opiates so that they may then experience the euphoric effects of drugs at much lower dosages, detoxification programs can and should seek to encourage referral. The surprising extent to which this can be accomplished is discussed below.

Other Objectives: Making the Most of Treatment Contact

> Staff . . . are caught up in the current treatment culture with its implicit emphasis on abstinence at all costs and with consequent failure in almost every case.
>
> —Brotman et al. 1965

Detoxification programs have the opportunity—and thus the obligation—to address patient needs beyond those related to physical dependence per se. Clearly, a 2- or 3-week therapeutic regimen cannot hope to offer services such as job training and placement, legal assistance, or family counseling. But crisis intervention can be accomplished, and it frequently is possible to refer patients to relevant social service agencies in the community.

More direct intervention is feasible with respect to medical conditions. Pap smears, pregnancy testing, liver function evaluation, and even routine hemoglobin determination and microscopic urinalysis are among the wide variety of relatively quick, easy, and inexpensive procedures which can lead to the detection of problems which require referral for further diagnostic and therapeutic management. At a minimum, however, admission screening should be carried out to identify tuberculosis, venereal disease, and other contagious conditions which are not uncommon among an addict population. It is difficult indeed to overstate the benefit to the patient and to the general public when a patient is found to have one of these conditions and is referred for treatment.

POLICY ISSUES

Organizational Autonomy

It has been noted that some addicts enter detoxification treatment as a prerequisite to subsequent enrollment in a drug-free program. In such situations, a detoxification program complements a long-term treatment modality. If the full potential of a detoxification program is to be realized, however, it is essential that it not only complement, but also supplement the spectrum of treatment modalities which are available to a community. In other words, it must not be perceived, either by staff or by the addict population, as an initial phase of a comprehensive treatment approach. Rather, it must be viewed as an independent modality which, though maintaining close communication with other types of programs, has an autonomous staff, espousing and pursuing its own limited, but clearly defined, objectives.

As emphasized previously, the elimination of acute physical dependence on narcotics must be accepted as a sufficient, if not necessarily optimal, goal of treatment. In addition, detoxification programs can and should be viewed as a referral source, encouraging and facilitating transfer of interested patients to other programs—but these functions should not be permitted to become the program's raison d'etre. Put another way, eligibility for admission must not be made contingent upon an avowed commitment to accept long-term treatment after detoxification is completed. Quite the contrary: detoxification programs exist primarily to attract those addicts who do not accept long-term treatment. This ability to "reach the unreachable" will be compromised severely if the programs are perceived merely as intake centers for other modalities.

Duration of Treatment

Although readmission, as discussed below, should be encouraged, a maximum duration of treatment and a specified interval between treatment episodes must be defined. These definitions distinguish detoxification treatment utilizing methadone from methadone maintenance and "methadone-to-abstinence" approaches, and are currently spelled out in Federal regulations (U.S. Department of Health, Education, and Welfare 1972). Detoxification may not extend beyond 3 weeks, and the interval between discharge and readmission may not be less than 28 days. Although admittedly arbitrary, neither requirement is unreasonable.

Choice of Detoxification Method

Since there is cross-tolerance and cross-dependence among all opiate drugs, both natural and synthetic, any one can be used to prevent withdrawal symptoms and gradually detoxify the addict. In practice, however, methadone has been the medication of choice for the past 30 years. The primary advantages of methadone include its effectiveness when taken by mouth and its extended duration of action, necessitating administration no more frequently than every 24 hours. When general dosage guidelines are followed, detoxification with methadone is extraordinarily safe, virtually free of side effects, and remarkably successful in preventing the abstinence syndrome.

The use as detoxification agents of opiate drugs other than methadone, including diphenoxylate (Goodman 1968; Glatt 1972) and propoxyphene (Tennant 1973; Tennant et al. 1975), has been reported. Narcotic antagonists also have been employed to precipitate acute, but short-lived, withdrawal and achieve abstinence promptly (Kurland and McCabe 1976). Other withdrawal techniques, which do not rely on medication at all, have also been described. Laverne (1973) proposed coma induced by carbon dioxide as a detoxification method, and there have been several recent reports of the use of acupuncture with and without associated electrical stimulation (Wen and Cheun 1973; Wen and Teoh 1975; Shuaib 1976; Leung 1977). The latter approach, especially, is of considerable academic interest, and promises to help elucidate the mechanisms of narcotic action and the development of dependence and tolerance. The clinical utility of these alternative therapeutic approaches has not been established, however. Furthermore, even if effective, it is not clear what advantages they would have over the use of methadone in detoxification treatment.

Dosage and Administration of Methadone

Practices with respect to dosage and administration of methadone in detoxification treatment are governed by existing regulations of the Food and Drug Administration (U.S. Department of Health, Education, and Welfare 1972). The recommended initial dosage of methadone is 15-20 milligrams, but higher dosages are not prohibited. Paradoxically, the Food and Drug Administration regulations refer to somewhat higher initial doses in the case of maintenance treatment. During the first few days of treatment, however, there is no rationale for distinguishing between the two treatment modalities with respect to methadone dosage.

The experience of the New York City Methadone Maintenance and Ambulatory Detoxification Programs, which have initiated methadone treatment for over 100,000 admissions during the past 6 years, is that a starting dose of 30 milligrams is almost always sufficient to prevent withdrawal symptoms. With an inflexible upper limit of 40 milligrams on the first day of treatment there have been no mortalities and no serious side effects attributed to the medication. At the same time, there have been few complaints from either patients or staff that the limit which has been set is inadequate to prevent withdrawal symptoms. Although "splitting" the first day's dose of methadone was initially permitted in the New York City programs, it was found to be unnecessary and the practice was discontinued several years ago.

Regulations require that all methadone prescribed by a detoxification program be administered on the premises of the program; none may be given for "take-home" use (U.S. Department of Health, Education, and Welfare 1972). In view of the strictly limited duration of detoxification treatment, this is a reasonable restriction, and one which is accepted without criticism by program staff and patients. It ensures, of course, that prescribed medication is not diverted by patients.

Admission Criteria

There is only one relevant criterion for admission to detoxification treatment: current physiological dependence on narcotics. Determining dependence, of course, is not always easy. The effect of a narcotic antagonist on pupillary size can help confirm the diagnosis, as can preadmission urine toxicology. These procedures are not definitive, however, since they merely indicate recent narcotic use, rather than dependence. More useful is the "naloxone test," in which mild abstinence signs (e.g., gooseflesh) are elicited in the physiologically dependent subject. Generally, however, there is no need to go to such lengths if the history is credible and consistent with the findings on physical examination (credibility should be questioned, for instance, if an applicant claimed to have a $5 per day heroin habit after 10 years of steady use; a history of a $100 per day mainlining habit would be considered inconsistent if there were no evidence of intravenous injections on examination). Certainly, there is no justification for insisting on observing objective signs of withdrawal as a prerequisite to admission. The withdrawal syndrome, after all, is what the treatment regimen is designed to prevent.

Heroic measures to preclude admission of an applicant who is not physiologically dependent imply that there is an incentive for nonaddicts to seek such admission. There is no evidence to suggest that this is the case, and intuitively the possibility seems remote indeed. Diversion of methadone, as already noted, is ruled out by the regulations under which the programs must operate. The notion that nonaddicts would submit to the comprehensive intake evaluation (interview, medical history, physical examination, and laboratory testing) which is part of any approved program, merely in order to obtain "free" methadone for a few weeks, is highly implausible. In fact, the major danger which many programs are concerned with is that an entrepreneurial news reporter will make a spurious application in order to document that the admission procedures are "loose." This has occurred in both methadone maintenance and detoxification programs in New York City on rare occasions, but it is hardly justification for imposing needless, time-consuming and expensive hurdles to enrollment of those who need and want treatment.

Readmission Policies

If the limited goals of detoxification treatment are accepted as meaningful, staff will encourage readmission since the same objectives apply regardless of the number of prior enrollments in detoxification or other treatment programs. Eliminating, at least temporarily, physical dependence, providing a day-by-day alternative to illicit narcotic use, seeking to motivate and refer patients to addiction rehabilitation programs, and detecting and treating medical problems are as relevant on the 10th admission as on the first.

Reluctance to encourage unlimited readmissions reflects, in part, the concern that detoxification may become a "substitute" for long-term, rehabilitative treatment by making it "easier" for addicts and thereby detracting from their motivation to give up permanently their illicit drug use. Such a concern is not supported by experience. For example, in New York City, despite the availability since 1971 of prompt admission to either inpatient or outpatient detoxification facilities, the enrollment in methadone maintenance and drug-free programs increased from less than 12,000 at the end of 1970 to well over 50,000 4 years later. In fact, the "revolving door" phenomenon, which has been the primary target of the widespread criticism of detoxification treatment, is a positive reflection on this modality. Addicts "vote with their feet," and when they seek readmission, they are evidencing their perception that the services provided are meaningful.

THE NEW YORK CITY AMBULATORY DETOXIFICATION PROGRAM: A CASE IN POINT

The New York City Ambulatory Detoxification Program (NYC ADP) was established by the City's Department of Health in July 1971. The policies and practices of the program are described in detail elsewhere (Newman 1977), but in general conform to the principles described above. The NYC ADP comprises a network of free-standing outpatient clinics, operated according to uniform guidelines established and monitored by a central staff.[1] The program is organizationally distinct from the Methadone Maintenance Treatment Program which is also operated under the aegis of the Department of Health.

Acceptability to the Addict Population

Within the first 3½ years after the NYC ADP was initiated, there were 63,559 admissions of over 38,000 individuals (figure 1). The prescribed detoxification regimen varied between 7 and 10 days, and the average patient stay was 6 days.

There is strong evidence to suggest that the program was successful in its aim of attracting the otherwise "unreachable" addict. Overall, 72 percent of the patients had no prior long-term treatment for addiction, neither chemotherapeutic nor drug-free. The median number of years of addiction was 6, and as might be expected, those patients with more recent onset of addiction were the least likely to have had prior treatment. Even among those with an addiction history of more than 10 years, however, over 60 percent had never previously received long-term treatment (table 1). These findings take on added significance since, except for the unwillingness to accept long-term treatment, the addicts entering the

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[1] In fiscal year 1975, the NYC ADP annual budget was $1.3 million: $250,000 from the Model Cities Administration, $370,000 from the National Institute on Drug Abuse, and the balance from City funds. During the period discussed here (1971-1974), the NYC ADP represented about half of the total inpatient and outpatient detoxification capacity in the City of New York.

FIGURE 1.—*Cumulative total admissions and first admissions, NYC ADP, 1971-1974.*

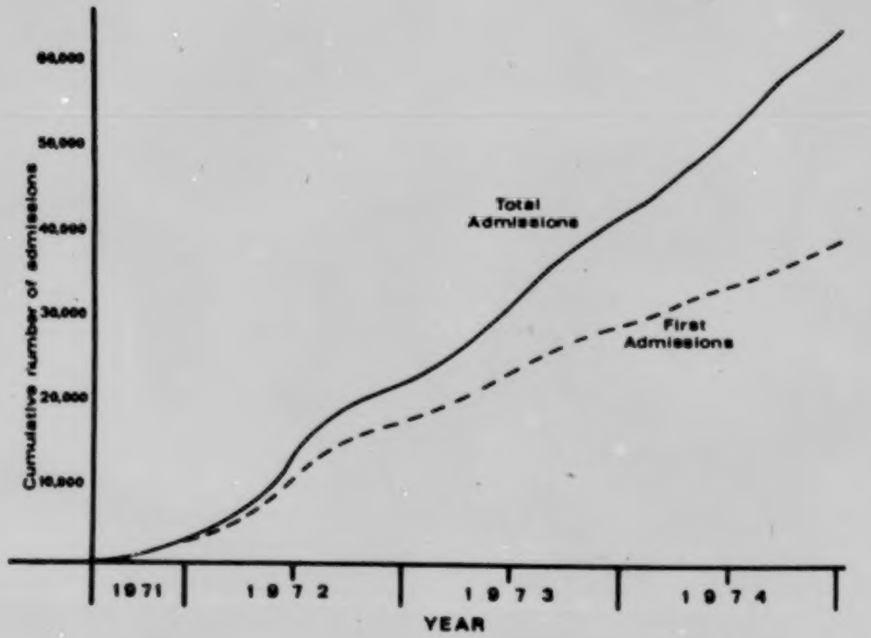

TABLE 1.—*Prior methadone maintenance and drug-free addiction treatment experience by duration of addiction for sample[1] of admissions to NYC ADP in 1974*

Prior treatment history	Distribution (percent) of patients with specified duration of addiction (years)						
	Total	Less than 2	2-5	6-10	11-15	16-20	Over 20
Number of admissions	5,373[2]	213	2,064	2,068	543	251	234
Methadone maintenance only	11.4	4.2	9.3	11.7	14.7	17.5	20.5
Drug-free only	11.7	3.8	11.1	12.6	12.3	12.7	12.4
Both methadone maintenance and drug-free	4.8	0.0	2.9	5.6	9.0	7.2	7.7
Neither methadone maintenance nor drug-free	72.1	92.0	76.6	70.2	63.9	62.5	59.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] Sample comprises all admissions during the following 12 weeks of 1974: weeks 11-13, 24-26, 37-39 and 50-52.

[2] Excludes 14 admissions for whom duration of addiction was not reported.

NYC ADP appeared to be representative of the addict population as a whole. For instance, when compared with addicts admitted to the City's Methadone Maintenance Treatment Program, there were no major differences at the time of enrollment with respect to age, duration of addiction, prior criminality, employment, or dependence on public assistance.

In view of the fact that by the latter half of 1972 there were no longer waiting lists for either drug-free or chemotherapeutic programs in New York City, it is clear that a large proportion of the addict population which rejects long-term treatment does accept detoxification.

Referral to Long-term Treatment Programs

It has been noted previously that many addicts candidly acknowledge that their primary objective in seeking detoxification treatment is to lower their tolerance in order to achieve euphoria with smaller quantities of narcotics. It might be argued that accommodating this hedonistic objective tacitly condones and supports addiction, and thereby lessens the likelihood that these addicts will accept long-term rehabilitative care.[2] The experience of the NYC ADP refutes such an argument.

The New York City Ambulatory Detoxification Program routinely conducted followup of patients referred to long-term programs. The criteria of "successful" referral were defined rigidly: individuals whose admission to a long-term program was arranged by NYC ADP staff, who entered the program to which referred, and who remained in treatment 1 month following completion of the detoxification regimen. According to this definition, more than 9,000 addicts, 15 percent of all admissions to the NYC ADP through the end of 1974, were successfully referred. Approximately two-thirds of the referrals were to ambulatory and residential drug-free facilities, and one-third to methadone maintenance and "methadone-to-abstinence" programs.

Initially, the NYC ADP staff was surprised at this relatively high proportion of patients willing to accept and follow through with referral. Recent data on a national level, however, are not inconsistent with the NYC ADP experience. Thus, of the 50,533 patients leaving federally funded detoxification treatment during 1976 (NYC ADP data are not included), the reason for discharge was "transferred/referred" for 25 percent (National Institute on Drug Abuse 1977). It is also important to note that, in the case of the NYC ADP, there was no difference among first-admissions and those previously treated in the program, either with respect to likelihood of successful referral, or the modality to which referred (i.e., drug-free or chemotherapeutic). In other words, there was no definable subgroup of patients who "used" the NYC ADP as a substitute for seeking long-term, rehabilitative services.

SUMMARY AND CONCLUSION

> Critics unreasonably consider as complete treatment failures addicts who stay off drugs for an indeterminate period but subsequently relapse. Temporary or periodic freedom from addiction is frequently an economical therapeutic result.
>
> —Knight and Prout 1952

Detoxification treatment of narcotic addiction has been widely rejected as a distinct treatment modality. Critics have focused on the undeniable limitations of this short-term therapeutic approach. Unquestionably, if the usual criteria of treatment effectiveness are applied, detoxification is unsuccessful in achieving permanent abstinence, decreasing unemployment and dependence on public assistance, and in other ways "rehabilitating" the patient. On the other hand, there are goals which are applicable to detoxification treatment, and which can indeed be achieved.

The rationale presented here for detoxification as a distinct treatment modality, to supplement other addiction treatment approaches, is supported strongly by the experience in New York City. In 1971, when the establishment of the NYC ADP made detoxification available promptly to tens of thousands of addicts each year, the waiting time for admission to long-term programs was many months. Subsequently, drug-free and methadone maintenance capacity was expanded dramatically, and the active census in such programs increased from 12,000 in 1971 to over 50,000 by the end of 1974. Today, however, the overwhelming majority of narcotic addicts in New York still receive no treatment, and long-term treatment facilities are at or very near capacity. Throughout each of these phases in the recent history of the narcotic addiction epidemic in New York City, detoxification has been in tremendous demand. The NYC ADP and other detoxification programs have provided—and continue to provide—an alternative to illicit narcotic use. The costs, in terms of lives, property, and suffering had this alternative not been available, are incalculable.

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[2] Similar logic has been employed by critics of long-term treatment as well, who have maintained that providing treatment services to addicts implicitly encourages drug use in the first place. The rationale appears to be that absence of treatment would act as a deterrent to use of illicit drugs. History, in this country and overseas, refutes such a hypothesis. The chronology is clear, and consistent: first drug use becomes widespread, and only then are treatment efforts launched by an aroused community.

Clearly, the widespread reluctance to accept detoxification treatment as a meaningful therapeutic approach is not shared by the addicts themselves. Those who are responsible for funding and operating treatment programs cannot afford to ignore the judgment of those the programs are intended to serve. Pragmatism, humanitarianism, and self-interest make it imperative that society acknowledge the significance of the limited goals which are applicable to detoxification treatment, and support programs which can achieve them.

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3. Outpatient Drug-Free Treatment

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INTRODUCTION

"Outpatient drug-free treatment" is a term that has come to describe a variety of drug abuse treatment programs often having little in common with each other except they do not use methadone or narcotic antagonists and are not residential. As used by the National Institute on Drug Abuse in its CODAP data collection system, the term is defined as "A treatment regimen that does not include any chemical agent or medication. However, drugs may be used as an adjunct to treatment or to treat any medical problems the client may have. Temporary use of medication (e.g., tranquilizers) for treating psychiatric problems may occur in drug-free modalities. Primary treatment method is traditional counseling" (NIDA 1977a). Since the treatment of non-opiate abusers is described elsewhere in the book, this chapter will limit the discussion of outpatient drug-free (OPDF) to those modalities that provide services to opiate abusers, recognizing, of course, that many of the methods would be equally applicable to polydrug users.

The significance of the OPDF approach in the treatment of opiate users can be seen by looking at a few statistics. In one of the CODAP reporting periods, for example, in the second quarter of 1977, 21 percent of all opiate abusers admitted were put in OPDF slots as compared with 23 percent into outpatient maintenance slots. (Drug-free day care made up an additional 2 percent.) In terms of numbers, this amounted to approximately 3,900 in OPDF and 4,250 in outpatient maintenance. This might surprise many who view the national treatment effort as being mainly directed to methadone maintained clients. In fact, the numbers of clients in treatment in mixed federally and nonfederally funded units as reported in the April 1977 National Drug Abuse Treatment Utilization Survey (NDATUS) show that OPDF is the single largest modality. In addition, OPDF is only slightly behind maintenance treatment in utilization (NIDA 1977b).

In spite of these large numbers, the Federal officials responsible for overseeing programs apparently have very mixed feelings about the use of OPDF for opiate abusers. ". . . the possibility of effectively treating compulsive abusers of high risk drugs in outpatient drug free slots is highly questionable. People abusing opiates and barbiturates generally need either medication or the structure and supervision provided in a day care or a residential program. . . ." (The White House 1972)

Modality	No. of Clients in Treatment	Utilization Rate (percent of available treatment slots in use)
Maintenance (includes methadone, LAAM, and Darvon), Outpatient	31,074	95
Residential, Drug-free	8,617	88
OPDF	54,607	91
Total	94,298	—

This chapter will describe the various kinds of clients with whom OPDF is used, the various ways it is used, and look at the studies that have tried to compare outcomes between drug-free and maintenance types of approaches to see if the above pessimism is appropriate. Finally, the chapter will look at the implications of the data for future treatment and research in this area. Certain innovative approaches, such as acupuncture and transcendental meditation, which do not involve drugs and are usually done on an outpatient basis, will not be covered in this discussion.

THE CLIENTS

A useful introduction to the component parts of OPDF treatment is a discussion of appropriate client populations. We have chosen to divide the clients into four groups, based on their relation to previous drug treatment, since this is a useful way of understanding the approaches needed. While these groups are not necessarily exclusive and for practical reasons are often treated in one setting, describing them separately is helpful in clarifying the nature of the outpatient drug-free approach.

These groups are (1) clients seeking their first treatment experience, (2) successful completers of other treatment modalities, (3) clients who have relapsed following other treatments, and (4) clients requiring treatment after a prison or hospital stay. Each of these groups can differ within itself and between categories in regard to age, sex, ethnicity, economic status, education, and length and degree of severity of their opiate problem. They can range from opiate experimenters to seasoned hard-core heroin addicts, and one could construct client categories on the basis of any of these characteristics. Thus, one could divide clients into experimenters, "chippers," daily users, or current nonusers (on the basis of type of use), or into early adolescents (12-16), late adolescents (17-20), young adults (21-25), and adults (26+) on the basis of age. In practice, programs must take a number of these factors into consideration when devising a treatment plan, and failure to do so will often lead to treatment failure.

The New Client

Opiate users seeking their first treatment experience are considered appropriate candidates for OPDF programs for several reasons—some of them purely legal in nature. Many potential clients are, by reason of chronicity and length of opiate use and/or age, ineligible for chemotherapy approaches such as methadone maintenance. Such clients will not meet current Federal maintenance guidelines which include a documented addiction history and attempts at previous treatment. (It should be noted that at the time this is being written, an extensive liberalization of the Federal methadone regulations is under consideration.)

In addition to the legal restrictions, a consideration characteristic of the medical model is that it seeks to utilize the least radical intervention when initiating therapy. "Primum non nocere" (a loose translation—"the first rule is not to do any harm") remains a viable dictum. OPDF treatment is, by definition, a low intervention approach when compared to the chemotherapeutic modalities such as methadone maintenance or the narcotic antagonists, or to the varieties of residential programs. As such, it is often considered the treatment of choice for the opiate abuser seeking his/her first program. It needs to be kept in mind, however, that this first treatment contact may occur from a few weeks to years after initiating heroin use. In general, almost all of the less experienced clients are there on the basis of legal or family pressure, while the more experienced individuals often go on their own.

Implicit in these considerations for assignment to OPDF treatment should be the fact that an armamentarium of higher interventions is available for the client who requires them. Thus, an important function of a low intervention modality is an evaluative one. The client applying for treatment for the first time will often present little historical information upon which to base an appropriate level of intervention. In these cases, assignment to a low intervention program can provide a setting in which to evaluate a client's strengths and weaknesses.

There is little empirical evidence, although a lot of clinical presumption exists, that a client can be successfully profiled in advance as a probable success or failure in OPDF treatment. Pragmatic considerations, of course, do operate in treatment assignment and for this modality usually center around the degree of social stability evidenced by the client. However, the reported retention rates for this form of treatment (to be discussed later in this article) suggest a far more complex set of determinants for success and support the point of view that one of the most effective ways of evaluating each new client's needs is to attempt treatment at the lowest level of interaction.

In a somewhat more negative vein, the OPDF program can serve what we have come to call the "enough rope" function. Clients who belong elsewhere are often assigned to OPDF treatment because there is insufficient motivation, internal or external, to promote acceptance of a higher intervention modality. Failure in the OPDF program can provide the impetus required to accept other, more appropriate, levels of treatment. Such failure may be a necessary factor in getting an individual client to face the severity of his/her difficulty. It can also be extremely influential with external sources of pressure for treatment, whether these be family or social institutions such as courts, parole/probation, schools, etc. Often these external sources either need to down play the severity of the problem because of emotional family ties or tend to accept the client's protests (as happens at times with probation officers) that the problem is solved and they do not need to go into a residential facility.

The Successful Client

OPDF treatment has a role to play in the management of the successful completer of other forms of treatment. The maintenance of therapeutic contact following successful completion of a treatment regimen is a crucial issue for drug programs. High intervention modalities, whether residential therapeutic communities or drug maintenance programs, consistently report the difficulty of returning clients "to the community" following intensive treatment experiences. It has proven problematic to maintain contact with clients no longer requiring chemical or residential support in the same setting with those that do. And, too often, the result is a complete cessation of all program contact with the successful client. The OPDF treatment program provides a setting where such clients can obtain the modified degree of support desired in the company of others also not requiring more intensive intervention. Placement with clients who have more stable community involvements and who are required, in large part, to function responsibly and independently of the treatment program can be a logical transition for the successful methadone maintenance or therapeutic community patient.

The Client Who Has Relapsed

Relapse to opiate use is an unfortunate fact of life for drug treatment programs. The ability to reinvolve a client in treatment is, therefore, a critical issue. This may be a difficult task, especially if the client has invested a significant amount of time and effort in previous treatment. The client who has already experienced 12-18 months of intensive residential treatment or 2 or more years of methadone maintenance may well be reluctant to present himself/herself for another treatment episode. Similarly, social institutions which have contact with relapsed drug users, i.e., the courts and parole/probation offices, are often loath to return a client to intensive treatment programs when they have already had one or more such experiences. Indeed, such a placement may not be appropriate. Relapse to drug use does not necessarily indicate that all gains made during previous treatments have been lost. What level of intervention is required can only be determined after testing and evaluation of the client's current status. OPDF programs are suited to this task. Assignment to this level of intervention recognizes the progress made by the client in the past and provides a setting where both the client and staff can evaluate his/her present needs.

The "enough rope" function described earlier can also play a role with this type of client. When higher levels of intervention are required, their acceptance may need to be based on the client's own recognition of their necessity. For many clients, however, the support provided by an OPDF program may be sufficient and reinvolvement in more intensive treatment may be avoided.

The Client Leaving Hospital or Jail

The final client group we are considering is made up of individuals seeking treatment following an episode of hospitalization or incarceration. It is presumed in either case that the client is presenting in a drug-free state but requires ongoing support to remain abstinent. Again, such clients may be unwilling to accept intensive treatment programs or chemotherapeutic regimens. OPDF programs here also serve an evaluative function. They will often be called upon, in addition, to serve as coordinator for other services in the community. Clients, especially those leaving prison, will often present with a host of nondrug-related problems that require immediate attention. These will include housing, employment, problems with family or spouse, etc. These areas are often more pressing than drug-specific needs and may be more crucial to the client's transition back to the community. The development of linkages with other community service providers will be discussed at greater length in the next section.

COMPONENTS OF OPDF TREATMENT: APPROACHES TO REHABILITATION

Much of what will be included in this section is evident from the discussion of OPDF clientele. OPDF programs run the gamut from "drop-in" rap centers to more structured, therapeutically oriented approaches.

Rap Center

Rap center is a broad treatment category, lacking specific programmatic or administrative definitions. The concept covers a range of service delivery systems from the informal, often volunteer, storefront operation to formally funded community based programs that may be part of a larger umbrella agency. In common, however, the rap centers depend on peer relationships developed through various activities. These involve sports, arts and crafts, community and religious activities, etc. The peer relationships so developed serve as a basis for "rap sessions" designed to explore alternatives to drug use. This form of intervention is largely aimed at the neophyte drug user and may be viewed as a means of both primary and secondary prevention (Kleber 1974). Because of its usual location within the community, a rap center may also serve as an entry point to treatment for individuals with more severe drug problems.

The more structured OPDF programs are designed to provide specific therapeutic interventions. A range of counseling approaches as well as innovative techniques such as behavior modification, etc., are offered.

Counseling

Counseling is the backbone of most OPDF programs. The kind of counseling as well as its orientation and frequency will vary depending on the client and his/her progress in treatment. Most counseling techniques derive from traditional psychotherapy with an admixture of approaches developed by "concept" programs such as Synanon and Daytop. Individual and group counseling are the two most widely used variations, with couples and family counseling gaining increasing attention. In addition, consultation with other individuals directly involved with the client can be viewed under this heading—including school officials, parole or probation officers, etc. The qualification of the individual providing counseling may vary widely from the academically trained to the ex-addict. Some programs opt for one or the other type of counselor, while others prefer the range of approaches provided by a mixture of background.

Counseling techniques tend, on the whole, to focus on the "here and now," often called "reality therapy," and to eschew attempts at insight therapy. The therapeutic goals of counseling will most often focus on questions of social adjustment with peers, family, school, job, etc. Although there may be significant differences between the approach of the ex-addict counselor and the professional therapist, they will generally have in common a concern to establish realistic goals with the client. Counseling sessions will vary in frequency depending on the client's needs and the resources available. In a structured program such arrangements are usually formalized with the number of sessions per week and appointment times determined in advance. In contrast to the rap center, drop-in visits are usually not encouraged. Individual counseling will often be augmented with periodic group sessions. Group meetings allow the individual client to share and explore insights and goals with his/her peers and to obtain support. Peer groups can be a valuable reference point where progress in treatment can be assessed. When, during the course of treatment, problems are uncovered which demand more intensive treatment, they may require referral to other mental health resources.

Behavioral Approaches

In recent years some attention has been paid to the application of behavioral approaches to the treatment of opiate abuse. The behaviorists view addiction as a learned behavior that is maintained and reinforced by conditioning factors. The behavioral treatment approach is two-fold: (1) It involves the decrease in the reinforcing properties of drugs, and (2) it seeks to provide behaviors incompatible with drug use.

These techniques, which are examined more systematically in another chapter in this volume, include aversive conditioning, using chemical or electric as well as verbal aversion methods, relaxation training and systematic desensitization, assertive training, and contingent reinforcement methods such as token economy.

Although there are some promising reports, more carefully controlled investigations in outpatient settings are required before these techniques can be considered viable treatment alternatives.

Family Therapy

After a number of years of neglect, there has been a recent upsurge of interest in family therapy with drug abusers. The neglect had a variety of possible causes, some of which still exist. First is the method of Federal financing of drug slots whereby there is no incentive to involve the family. Reimbursement is the same per slot regardless of whether the individual client is seen for a couple of hours a month or the whole family is seen daily. A second possible reason for the neglect lies in the way families have traditionally been viewed by therapeutic communities. The usual procedure in many of these programs has been to cut off as much contact as possible between the resident and the family until the resident is "ready" to cope with them. Since many of the outpatient programs derive their theories and staff from the therapeutic communities, it is not surprising that this attitude of shunting the family aside has been transplanted, too. A third possibility for some programs is that they view drug abuse as stemming from societal pathology and consequently do not see a role for the family in their treatment model. A fourth reason for other programs, especially those dealing with youth, is they see the family as the enemy and try to build up credibility with their clients by attacking the family. A fifth possibility is the relative lack of experience and training of program staff in the areas of parent-child relationships, diagnosis, and therapy. This gap, of course, also exists in many other parts of the mental health field. Finally, there is the family itself. Many families of addicts have such a vested psychological interest in having the addict remain dependent, they either will not come in or do their best to sabotage the treatment. Regardless of the reason, the net result is usually that the family of the drug abuser is either excluded from the treatment or excludes itself from it.

Stanton (1977) has recently reviewed the theoretical aspects of the family's role in drug abuse and made a strong case for involving them in the treatment process. Given the difficulty involved in outpatient drug-free treatment where one has neither the blockade effect of methadone or naltrexone nor the support of the 24-hour residential community, it would seem that getting the family involved would be one of the few really supportive steps one could take. Stanton, in fact, would probably argue that without such involvement, it is unlikely the program could be very helpful. He sees drug taking as "serving the dual function of simultaneously letting the addict be distant, independent, and individualized, while at the same time making him dependent, in need of money and sustenance, and loyal to the family." (Stanton 1977).

Because of the relatively recent use of family therapy in the treatment of heroin addiction, there is relatively little outcome research to go by to enable one to choose between the differing types that have been used. The approaches that could be used as part of outpatient drug-free treatment include marital therapy, group marital therapy, family mediation, family problemsolving, psychodynamic family therapy, structured/strategic family therapy, and multiple family groups.

Referral

Given the limited resources of most OPDF programs and the wide-ranging needs of the client populations, the development of referral linkages with other existing service delivery systems is essential. Effective referral makes a number of demands on the referring agency. These include an accurate assessment of the client's needs, an understanding of the services offered by the agency to which the referral is being made, and thorough followup and evaluation of the referral.

A partial listing of services which may be utilized by the drug treatment program includes:

- Health services
- Mental health services, including individual, group, couples and family therapy, etc.
- Education services, including guidance, G.E.D. classes, remedial services, scholarship information, etc.
- Vocational services, including guidance, placement, training, etc.
- Legal services, including legal aid, etc.
- Housing and financial services, including welfare, A.D.C., food stamps, etc.

An analysis of existing resources is also necessary. Some services may exist only on paper or are too overwhelmed by demand to be effective. Other services may officially, or in fact, exclude drug users as recipients. Legal recourse has sometimes been necessary to obtain services for the drug abuser.

Followthrough of referrals is required in order to maintain a viable relationship with service providers. Drug abusers are often not the most appreciative receivers of services, and active involvement of the referring agency may be required at all points in which the client is involved with an outside agency in order to prevent blanket avoidance of all drug clients.

Federal Funding Criteria

Specific criteria have been established by the Federal Government for drug treatment programs, including outpatient drug-free. While most of the criteria are common to all types of programs (e.g., the need for individual treatment plans) a few points are specific to OPDF. These will be noted here, but a general review of all the criteria is advised. The criteria cover, for example, the contents of the initial physical examination and laboratory data, the need for early involvement in educational or vocational programs, urine testing, and minimum types of supportive service and professional staff required.

> For outpatient methadone and outpatient drug-free programs, a minimum of 3 hours of formalized counseling per week shall be made available for each patient either by the program or by an outside qualified consultant under a contract. For residential drug-free, residential methadone, and day care drug-free programs, a minimum of 10 hours of formalized counseling per week shall be made available for each patient either by the program or by an outside qualified consultant. The hours of counseling actually provided should vary according to the needs of the patient.
>
> A reasonable effort must be made to adjust the hours of program operation to meet patient needs. For outpatient treatment programs, consideration should be given to the employment hours of patients, and, to the extent practicable, clinic operating hours should be scheduled at such times as will accommodate the working hours of such patients. Where necessary to accommodate the needs of patients, the program must recognize that the usual 9 a.m. to 5 p.m. workday shall not be rigidly adopted for outpatient treatment. In many clinics with large patient admissions, a 12 hour day of operations is frequently necessary.
>
> Each outpatient drug-free program shall provide services at least 6 days per week. Services provided on at least five of these 6 hour days shall be on the basis of an 8 hour day provided that a minimum of 2 hours of such 8 hour day must be scheduled at a time other than the regular 9 a.m. to 5 p.m. day. Services administered during the remaining (sixth) day must be scheduled for a period of at least 5 hours.
>
> —Special Action Office 1975

OUTCOME

The studies by Sells and his colleagues (1977) examine the outcome of a sizable group of narcotics addicts treated in different cities and in a variety of treatments (see chapter on Treatment Effectiveness). Although flawed, their size (44,000 subjects, with much smaller numbers in the followup) renders them unique at this stage of evaluation. Before looking at their conclusions about OPDF, one should keep in mind what some of these flaws are: They had no control over patient sampling, selection for treatment, or which agencies participated. There was no random assignment to treatment and the nature of the treatment may have changed in the course of carrying it out. Finally, "outcome" usually meant what the patient said it meant via self-reports rather than objective verification (Blum 1977).

In terms of type of clients, OPDF had clients that were less deviant at admission, that is, less hard core than methadone maintenance or therapeutic community patients. They had less daily opiate use, lower arrest rate, and less chance of having been in jail or drug treatment. The outcomes following the DARP (Drug Abuse Reporting Program) admission "were generally quite favorable for the treatment modalities methadone maintenance, therapeutic communities, and drug-free and less than favorable for the DT (detoxification) and IO (intake only) groups." Applying analysis of covariance to effect a statistical comparison of treatment modalities after controlling for certain pretreatment variables, the authors report, "there is strong evidence that two treatment modalities—methadone maintenance and therapeutic community programs—show significantly less opioid and nonopioid drug use (excluding marihuana) as well as higher employment and lower criminal activity. It is noteworthy that drug-free patient treatment is equally effective (our emphasis) as these other modalities regarding illicit drug use and employment, but is markedly less effective regarding criminal activity." The authors caution though that although "some interesting differences were found between methadone maintenance, therapeutic communities, and drug-free on specific criteria, . . . the judgment concerning which group had the 'best' outcomes depends on subjective factors and is not entirely an empirical matter. The goals and philosophies of these treatment modalities are substantially different in many respects, and decisions concerning their relative success, based on outcome data, are dependent on the ideological positions and values of the reader" (Sells et al. 1977; Simpson et al. 1978).

Other evaluations performed on smaller samples have produced varying results. A study by Burt Associates of data they collected on the Narcotics Treatment Administration (NTA) in Washington, D.C., and data collected by MACRO Systems on the Addiction Services Agency (ASA) in New York City, showed no significant differences between treatment modalities (methadone maintenance, outpatient drug-free, therapeutic community, and a never-in-treatment comparison group) on drug use, criminal behavior, or employment (NIDA 1977c). Other reports from NTA indicate no differences on similar behavior outcome measures (except for retention after 6 months, DuPont 1972; Brown et al. 1973), whereas 12-month followup data from the same programs show significantly more favorable results for methadone maintenance as compared to OPDF of all outcome measures—drug use, arrests, employment, and retention (Brown et al. 1972).

A study by McCabe et al. (1974) reports a less successful outcome for methadone maintenance treatment failures enrolled in OPDF programs, as compared to clients without previous treatment experience.

It is clear from reviewing the data just presented that OPDF treatment, while perhaps not doing as badly as had been predicted by many in the field, certainly does not come through as a superior modality of treatment. In comparison with methadone it is surprising how often there is little difference between certain kinds of outcome results. What emerges is that the subjective sense of clinicians that methadone maintenance and therapeutic communities are far superior to OPDF cannot be substantiated by followup data. It is important, however, to keep these findings in perspective. The shortcomings in all these studies reported are as follows: (1) None of these involved random assignments. The clients that ended up in the OPDF programs were very different in terms of their opiate problems from the persons in either therapeutic communities or in methadone maintenance. Other differential factors such as age and ethnicity also appear to differ markedly between OPDF and methadone maintenance, making a nonrandom comparison very problematical even with statistical adjustment. (2) Although it was noted that the average length of stay in methadone was 2½ times longer than that in the OPDF program, this may be due more to program expectation than to patients simply terminating early. (3) We have lumped all the studies above as outcome measures for OPDF. It is obvious from our earlier discussion, however, defining OPDF, that we may be dealing with a variety of different kinds of programs. Methadone, on the other hand, tends to be somewhat more standardized, although as Sells (1977) and others have pointed out, there are a number of different types of methadone programs also. (4) Just as we noted in item 3 above that some outcome studies lump the various types of outpatient drug-free programs, likewise they put together the various kinds of OPDF clients. As noted, there are a variety of clients who seek out or who are put in OPDF programs, and it is reasonable to guess that there are marked differences in outcome between these various client types. (5) Confounding these studies not only of drug-free, of course, but also of methadone is the fact that they tend to treat each treatment experience as a discrete entity when in reality a one-shot treatment experience is not the rule. Most clients have a number of treatment experiences as well as a variety of treatment approaches that they are in during their treatment career. This makes it even more difficult to attribute to any one treatment episode or treatment method the outcome that occurs 4 or 5 years later.

IMPLICATIONS FOR RESEARCH

Although the state of the art with regard to evaluation of OPDF treatment indicates that careful investigation would increase our knowledge of this modality, several areas seem especially pertinent for study.

Client characteristics associated with success or failure in OPDF treatment. It is clear from the DARP data that various client characteristics are taken into account when treatment assignments or choices are made. While programmatic and legal considerations affect these decisions, other factors must also be operating. These factors include assumptions about what sort of client is best suited for which sort of program. Whether based on clinical intuition or experience, these determinants have not been subjected to controlled study. Such studies, which necessarily imply random assignment, could potentially resolve some of the ambivalent outcome results. "Statistical adjustment . . . (is) not equivalent to the procedure of random assignment." (Simpson 1978).

Program characteristics associated with success or failure in OPDF treatment. Studies which attempt to obtain followup data on sufficiently large samples to allow some generalizability of results are forced to lump together programs that may be very divergent in both philosophy and content. Even if client characteristics can be teased out of the evaluation equation, variability in programmatic approaches within the broad category of OPDF will continue to confound the results. Again, controlled studies, with carefully defined and replicable program characteristics, are the only rigorous solution to this quandry. It should be pointed out, however, that Simpson et al. (1978) were unable to find different significant outcome results between treatment types.

Comparison of OPDF treatment with other modalities. Until client and program characteristics are identified, this comparison remains an apples and oranges exercise. Indeed, if particular determinants of success can be demonstrated in varying program and client contexts, much of the concern for such comparisons may be obviated. The question then would become one of the goodness of fit between the client and the treatment.

IMPLICATIONS FOR TREATMENT

The pessimism about OPDF expressed in the quote in the introduction is a misunderstanding of the role this modality can play in the spectrum of drug abuse treatment services. It is not a substitute for methadone maintenance, antagonist maintenance, or the therapeutic community, and when it is used in such a capacity it may often fail. However, when used in one or more of the ways described earlier, it clearly can be of help to the client with a history of opiate abuse. It is cheaper than other forms of treatment and places less demands on staff time. This virtue can also be a danger as programs may use it inappropriately as a substitute for the higher intervention programs. To be most effective, there needs to be a careful assessment of the client's needs in relation to what the program can offer and well-trained staff who can carry out the various functions of the program in spite of limited patient contact.

Because of the potential for abuse, this kind of treatment needs to be closely monitored. The frequency of contact, for example, could range from hourly sessions three to five times a week for the experimenter with major family and social problems, to once a week or less for the stable therapeutic community graduate. In practice, however, the tendency has been to regress to the most minimal contact so that the national average is only two to three times a month. Only clients well on the road to rehabilitation are likely to find such a low frequency of contact a sufficient form of therapy.

Since Federal funding guidelines call for the same dollars per OPDF slot as is given to methadone maintenance, in spite of the latter needing medical and nursing personnel plus medication costs, security costs, etc., it is less likely that funds are insufficient for extensive OPDF treatment than that they are not used appropriately or imaginatively. While one could get around this by reimbursing units of service rather than patient slots, such a change must be approached with caution because of the increased paperwork involved and the difficulty in verifying documentation.

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4. Therapeutic Communities

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BACKGROUND

In January 1976, Therapeutic Communities of America, a consortium of drug treatment programs, together with the National Institute on Drug Abuse, cosponsored the first Therapeutic Community Planning Conference in Washington, D.C. This conference was, in a sense, historical. Never had therapeutic communities called themselves together for self-examination, self-appraisal, and the sharing of common concerns.

The meetings were successful in illuminating the state of the art and the status of the therapeutic community. Discourse ranged across the areas of research and evaluation; accreditation and licensing; articulation with the health care system; and the innovations, expansions, and internal problems of the therapeutic community. The full proceedings of these deliberations were published in the spring of 1977 (De Leon and Beschner 1977).

The conference also marked a milestone in the evolution of the therapeutic community (TC). Its prototype is ancient, existing in all communal forms of healing and support. It was found, for example, in apostolic religious groups and primitive tribal healing rites. Modern self-help antecedents include the Oxford Group, the Washingtonians, and Alcoholics Anonymous (Glaser 1974). Residential community facilities for psychiatric patients were established in England during the late 1940s, notably under the leadership of Maxwell Jones (1953). In this pioneering work, both treatment and residential management became the shared responsibility of patients and staff. The term "therapeutic community" evolved in these psychiatric settings.

The TC emerged as a treatment for drug abuse in Synanon, founded in 1958 by Chuck Dederich. Synanon and similar traditional programs (e.g., Daytop Village, Phoenix House, and Gateway House) reflect the philosophy and purpose of the historical prototype. By providing communal support for human error, human alienation, and mental and physical dysfunction, the therapeutic community represents a significant option to those who cannot be helped by the established social institutions.

Within the past 10 years, the therapeutic community has adapted to cope with mass drug abuse and a widening range of individual dysfunction. Thus, today the term therapeutic community is generic, describing a spectrum of over 300 residential programs serving drug abusers, criminal offenders, and the socially dislocated with less specific symptoms.

Though diverse in size (35-500 beds) and clientele served, many programs incorporate the regime of traditional therapeutic communities for drug treatment. These have made the greatest impact upon treatment.

The TC regimen includes encounter group therapy, tutorial-learning sessions, remedial and formal educational classes, residential job functions, and in the later stages, conventional occupations for clients in a living-out situation. Descriptive accounts of the traditional therapeutic community can be found in Rosenthal (1974), Nash (1974), Yablonsky (1963), and Casriel (1963).

The primary staff are nondegreed professionals. As former offenders, addicts and alcohol abusers, who themselves have been rehabilitated in therapeutic community programs, they serve in both clinical and custodial roles. Degreed professionals in vocational guidance, education, medicine, mental health, legal and fiscal administration, and research also comprise the staff of larger TCs.

48

While the optimal residential stay varies across programs, traditional TCs require at least 15 months in residence before return to the community, termination, or graduation. However, several programs have been experimenting with shorter periods of stay, ranging from 2 to 9 months, based upon client needs and progress.

No single theory—social, psychological or medical—guides or explains the activities, therapeutic techniques, or daily routine in the TC. Drug abuse and criminal behavior are viewed as signs of social disorder, family disturbance, and individual maladaptation. To effect change requires ongoing multidimensional influence and training, which for most can occur only in a residential setting.

Thus, fundamental to the TC concept is the necessity for a total 24-hour community impact to modify permanently lifelong destructive patterns of behavior. The basic goal is to effect a complete change in lifestyle: abstinence from drugs, elimination of antisocial (criminal) behavior, development of employable skills, self-reliance, and personal honesty.

Presently, the identity of the TC is changing, extending itself more fully into the public sector as a unique health care institution. Associated with this change has been the need for research and evaluation to help meet obligations of public accountability, to develop a more universal language, to improve treatment, and to provide a realistic sense of its limits.

RESEARCH AND EVALUATION

That research in the TC is in its beginning stages has been attributed to several factors, not the least of which are the methodological difficulties in treatment evaluation. These problems have been addressed in recent reviews of TC outcome studies by Bale (in press); Brook and Whitehead (1977), Held (1976), and Smart (1976), and are discussed by Sells elsewhere in the present volume.[1]

A less obvious factor, however, has been the genealogy of the therapeutic community. Medical treatments descend from a science-oriented tradition. Doctors and researchers could administer treatment and sensibly document it with a sophistication which facilitates the publication of research papers. In contrast, the former addict, alcoholic and criminal offender, neither spoke nor cared for the language and logical rules of science. Quantified reports could not surface, and credible descriptive narratives made only scattered appearances.

Recent years have witnessed a burgeoning of evaluation studies conducted by individual programs and external research teams. Though still developing, the present body of information contains important implications for future planning and further inquiry. This chapter reviews the main research findings in relation to several interrelated issues of importance to the therapeutic community: treatment effectiveness, time in program, retention, relapse, and differences in individuals.

Outcome and Treatment Effectiveness

The main area of inquiry has been effectiveness, measured by treatment outcome, both short and long term. Other studies have examined retention, client profiles, and behavioral change in treatment. Although large-scale treatment process efforts now in progress have been excluded, the studies reviewed convey the essence of published research and were selected for recency, soundness of design, and clarity of results.

The outcome studies contained in table 1 are not uniform in design or methodology (sample size varied, as did length of followup period, number of programs and variables observed, and complexity of data analyses), but all dealt with at least one of three outcome variables—narcotic use, criminality, and employment. Although the self-report data utilized in these investigations were considered reliable, several included corroborating information from outside agencies.

All the studies in table 1 reveal that immediate and long-term outcome status of the clients followed are significantly improved over the pretreatment status. The Drug Abuse Reporting System (DARP) studies provide the soundest methodology for comparative evaluations of drug treatment modalities (Sells et al. 1976). In the DARP sample of TC dropouts and completed clients, a global outcome index—based upon opiate, nonopiate and alcohol use, arrest rate, additional treatment, and employment—revealed maximally or moderately favorable outcomes for more than 50 percent of the sample.

Similar findings are reported in the program-based studies of Phoenix House. Records from the criminal justice system in New York State, on a random sample of 202 male dropouts, revealed a 50 percent reduction in arrest rates maintained over a 5-year followup period.

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[1] See S.B. Sells, "Treatment Effectiveness, this volume.

TABLE 1.—*Recent followup studies of therapeutic community samples*

	Sample size	No. of TC programs	Length of followup	Source based	Employment	Drug use	Crime
DARP Studies (national; Sells et al. 1976)	510	10	1-5 yrs.	External	Favorable	Favorable	Favorable
Burt and Glynn (New York)	185	4	3 yrs.	External	Favorable	Favorable	Favorable
Nash (New Jersey; 1973)	125	6	2 yrs.	External	(1)	(1)	Favorable
System Sciences Inc., (New York, Brook and Whitehead)	958	12	2½ yrs.	External	(1)	(1)	Favorable
Phoenix House (New York; De Leon and Andrews 1977)	202	1	5 yrs.	Internal	Favorable	Favorable	Favorable
Daytop Village (New York; Collier and Hijazi, 1974)	40	1	2 yrs.	Internal	Favorable	Favorable	Favorable
Gateway House (Chicago, Holland, 1978)	193	1	1 yr.	Internal	(1)	(1)	Favorable
Ley Community (London, England; Smart, 1976)	61	1	2 yrs.	Internal	(1)	(1)	Favorable

[1] Not studied or not reported.

Favorable outcome indicates that the client status in followup achieved fixed criteria of success or significantly improved over pretreatment status. Program-based studies are internal while independent followup efforts are external.

A global index of outcome, based upon self-reported employment, opiate use, and criminal activity, indicated a maximally or moderately favorable outcome in over half of the sample. Moreover, the results significantly related outcome to psychological status objectively assessed in followup interviews. Longer staying successes registered the best psychological scores (De Leon and Andrews 1977, De Leon and Koslowsky 1978).

Time in Program

Early outcome studies of therapeutic communities focused on those clients who had completed programs. Results for these "graduates" were uniformly good, showing stable lifestyle changes reflected in the absence of opiate use or criminal activity, and completion of education and/or sustained employment from 1 to 5 years after treatment.

A recently completed long-term study of 60 male Phoenix House graduates (a random sample of all 1970-71 graduates) analyzed arrest records for a 10-year period. During the 5 years prior to treatment, 72 percent of the sample had been arrested, while less than 27 percent were arrested during the 5 years following graduation from the program (De Leon and Andrews 1978).

Graduates are a small proportion (10 to 15 percent) of all admissions and may also be a special minority, self-selected toward maximum probability of benefit. Statistically then, graduation (or completion) rates do not adequately reflect the treatment impact of the therapeutic community. When outcome status of dropouts is included, a more realistic picture of the TC emerges.

In the DARP and Phoenix House investigations, favorable outcome was found to be directly related to time in treatment (Sells et al. 1977, Simpson et al. 1977, De Leon 1977). Figure 1, for example, shows the change in criminal activities in a Phoenix House sample followed at least 3 years out of treatment. The magnitude of the decrease in posttreatment arrests (criminal justice records) is proportional to the time spent in residence. Similarly, the percentage of dropouts who later reentered drug treatment also decreased with time spent in the Phoenix program. On both measures residents in treatment at least a year maintained the highest rate of improvement in followup.

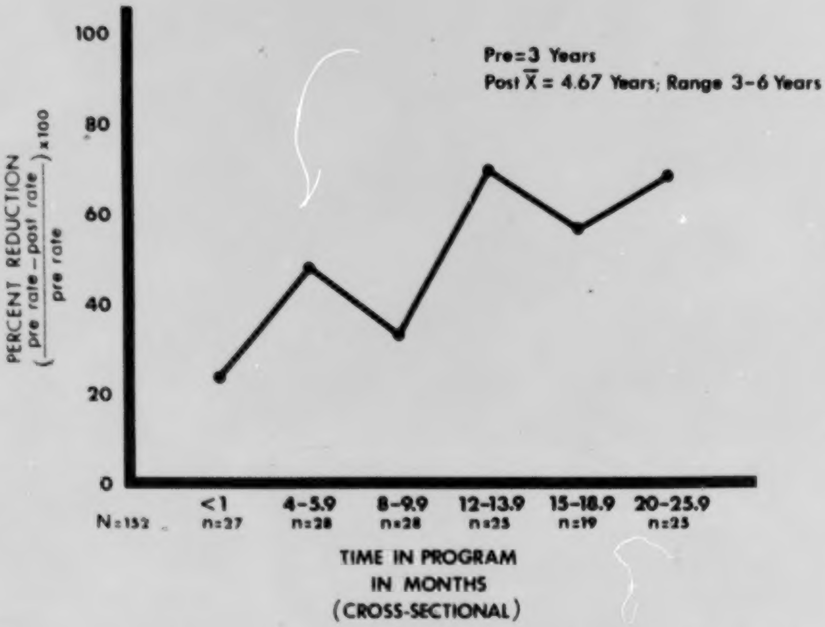
Other followup and intreatment studies have consistently corroborated the positive influence of time in program (e.g., Collier and Hijazi 1974; De Leon 1972, 1976; Nash 1973; Romond et al. 1975; Wilson and Mandelbrot 1978; Holland 1978).

Retention

A sizable proportion of all clients leave soon after entry and before treatment influences can be effective. Studies indicate a relationship between retention and residential time in program. The greatest proportion of dropouts occurs within the first 30 days after entry and thereafter decreases rapidly (Glaser 1974). Moreover, the probability of dropout depends upon time spent in treatment. Almost 60 percent of those clients who stay 5 months in treatment will remain at least an additional 6 months (De Leon 1976). Multivariate studies have also shown that time spent in program is the single best predictor of further retention (Wexler and De Leon 1977).

Attrition in TCs is not remarkably different from that of other drug treatment modalities. Nor is the problem of attrition unique to drug treatment. In the DARP sample, the TC dropout rate was 71 percent compared to 51 percent for methadone maintenance, and 74 percent for drug-free ambulatory programs. Among volunteer addict patients admitted to the Lexington Hospital during 1960-61, 74 percent were

FIGURE 1.—*Percent reduction in arrest rate for 5-year dropouts (age at entry 19 and older)*



Source: "Therapeutic community—Long term followup of dropouts and graduates." Report of project activities under grant DA 01228-01. Summary of paper presented to Director's Seminar, National Institute on Drug Abuse, Rockville, Md., October 26, 1977.

dropouts. A recent review of psychological treatments for nondrug abusers found 1-year retention ranged between 20 and 70 percent, averaging less than 40 percent (Baekland and Lundwall 1975).

While a legitimate concern, retention should not be confused with treatment effectiveness. As measured by outcome, the therapeutic community is effective for those individuals who stay long enough for treatment influences to occur. Thus, efforts which maximize holding power, that is, exposure to treatment, increase the likelihood of a positive benefit.

These considerations also bear upon matters of treatment costs. The large number of short-term residents constitutes a disproportionate drain on the program's resources. Much of the expense involved in treatment occurs during the individual's first days in the program when new residents receive more than they contribute. The longer clients remain in treatment, the greater their contribution to it, and the less it costs to maintain them. Thus, for the therapeutic community, appropriate cost benefit models must assess the pretreatment to posttreatment reduction in client social costs and the treatment expenditure incurred by actual length of stay.

Why, then, do people leave the therapeutic community? Although this question remains to be researched, several reasons are apparent. First, the TC's open door policy means that anyone can leave and anyone can enter. Admission criteria are purposively minimal (the overtly psychotic or violent are screened) so that many new entrants come through the door before they are ready to stay. Second, the traditional therapeutic community provides a long and difficult regime. It begins where others end, with drug abstinence as a condition of entry, not only a treatment goal. It aims for broad changes in lifestyle, breaking down old behavior patterns while instilling new values and training in life skills. The constant pressure for change precipitates leaving at any stage of residence but is particularly threatening in the early days. Third, a homogeneous treatment applied to a diversity of clients increases the probability of dropout. Clients progress at different rates in the TC. Experiencing no further changes, some leave out of frustration, boredom, a sense of success, or the belief that they have received all that could be offered. Dropping out is not necessarily unhealthy, an observation supported by time in program studies reporting success, particularly among dropouts who remained in treatment more than a year.

Individual Differences

That the TC is suitable for certain individuals is revealed in studies of the social and psychological differences among clients who seek, remain in, and benefit from the TC.

Social demographic profiles of drug abusers who come to traditional therapeutic communities appear relatively constant. Minority group members with inadequate education and unstable family background are overrepresented in TC populations. Psychological measures show clients tend to be in the deviant range, although frank clinical sickness is screened out at admission and rarely occurs in the residential populations (De Leon 1976).

Clients usually enter the TC measurably depressed, anxious, and with characteristically low self-esteem. This picture generally improves rapidly, although the levels of disturbance tend to remain deviant. Psychopathological signs are fewer among male opiate addicts and more evident among females and in ethnic subgroups underrepresented in TC populations (De Leon 1976; Olmezer 1977).

In Phoenix House, a traditional therapeutic community, retention is longer among male opiate abusers in their early to middle twenties and shorter among females, the young, and polydrug abusers. Data from several TCs relate higher severity of psychological disturbance to early dropouts. Graduates and long-term residents tend to show better psychological profiles (De Leon 1976; Zuckerman et al. 1975).

Guided by the facts of retention and individual differences, TCs must exercise more flexibility in program practices. In particular, programs need to strengthen their remedial, vocational, and educational capabilities to develop the social potency lacking in most of their minority clients. For the proportion of individuals whose drug abuse correlates more with psychological disturbance and less with social deficit, programs require expanded treatment resources utilizing family therapy, counseling, and varieties of current psychotherapeutic techniques.

Relapse and Retreatment

The interpretation of relapse is complicated by several issues. First, in all varieties of mental health therapy, institutional or outpatient, relapse is the rule. In this regard the therapeutic community treatment is no exception and its relapse rates should not be judged unfairly.

The second issue relates to the definition of relapse. Relapse is usually viewed as any return to drug abuse, criminality, or less often to public assistance. While useful for statistics, this definition tends to obscure the dimension of client improvement.

Similarly, program philosophy of rehabilitation often shapes the perceptions and criteria of relapse. For example, staff in traditional TCs do not view drug abuse as a recurrent, or chronic disease, but as behavior that can and should be completely eliminated. Thus, TC clients who do not maintain the criteria of full rehabilitation tend to be judged relapsed or failures by themselves and others.

Third, relapse and retreatment can be misleading measures of treatment effectiveness since both are often influenced by nontreatment factors. These include availability of heroin on the streets, treatment options, the dynamics of the economy, and the social (middle class) use and tolerance of licit and illicit chemicals for hedonistic or pharmaceutical purposes. Moreover, a positive initial TC experience may influence seeking and benefiting from later treatment. Further studies must investigate the form of relapse (whether to criminality or to drug abuse), and the client and situational characteristics associated with it.

Estimates of readmission to treatment range from 30 to 60 percent. In the Phoenix House studies, about 40 percent of first admission dropouts later returned to Phoenix or other programs, methadone or drug free. The second admissions to TCs tend to stay longer. Their success rate is assumed to be somewhat greater than single admission clients, although precise data on this have not been developed.

Few readmissions come from graduates and long staying dropouts. Most of these former clients do not become reinvolved with drugs or crime, although a proportion reveal problems with employment, alcohol use, and/or social isolation. Of those who do relapse, severity is limited when compared directly with their pretreatment status. Thus, though relapsed, they are not necessarily regressed. Understandably, those who relapse or who show marginal adjustment problems are reluctant to return to treatment. Often their lives have conventionalized with age; they maintain family or work responsibilities. All of these individuals need new help, but their old patient roles are not appropriate. Nor can they utilize or benefit from existing mental health services.

These former TC clients require alternative forms of intervention. New designs must offer a range of counseling and educational resources, together with the TC ingredients of support and self-help to be relevant for the client's present needs and changed status in life.

BROADER ISSUES AND FURTHER IMPLICATIONS

Does success or improvement relate to treatment, situational, or client factors? Unfortunately, a satisfactory answer to this question has still eluded research strategies.

Matched untreated control groups are not feasible, given the extent of individual differences. No-treatment wait periods are unethical and impractical. Random assignment of clients to different treatments does not avoid self-selection problems since the individuals assigned are usually those seeking treatment. Even assignment by client choice of modality, when tried, has resulted in high attrition rates and has confounded interpretation of results. Without huge samples, random assignment simply does not assure an equal distribution of the "match" between client and program.

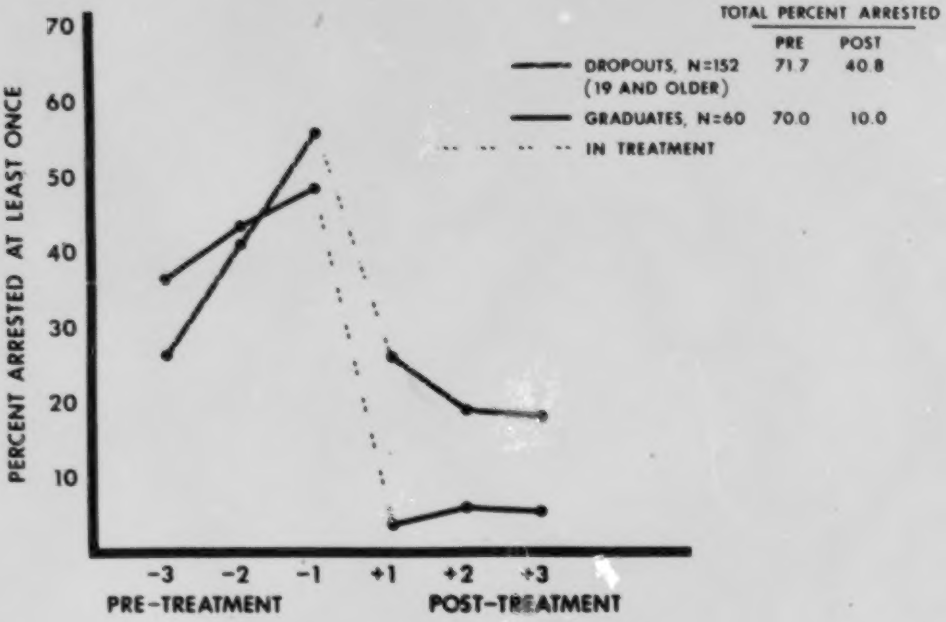
Added to these difficulties are the apparent influences of maturation and/or intercurrent life events that have been implicated in other studies (e.g., Nurco et al. 1975; O'Donnell 1964; Vaillant 1973; Winick 1962). The latter may include prison, military service, death of friends or relatives, marriage and birth of children, economic vicissitudes, and catastrophic physical or mental illness. Among these, the specific influence of treatment is obviously obscured, particularly over a long followup period of observation.

Therapeutic community data do indicate, however, that maximal improvement occurs in the first year posttreatment and is correlated with later adjustment, a finding which points to the immediate effects of the treatment experience. (See, for example, figure 2). Long-term stability of improvement, however, may still be affected by as yet unmeasured influences of maturation and/or intercurrent life events.

These perplexities need not invalidate the meaning of treatment itself. Clients who choose to be in therapeutic communities permit themselves to experience treatment influences; and positive benefits are more likely the better the quality of the treatment effort.

This interactional view of client and treatment factors provides a balanced interpretation of the

FIGURE 2.—*Percent arrested for dropouts and graduates year by year*



Source: "Therapeutic community—Long term followup of droputs and graduates." Report of project activities under grant DA 01228-01. Summary of paper presented in Director's Seminar, National Institute on Drug Abuse, Rockville, Md., October 26, 1977.

effectiveness of the therapeutic community. Moreover, it emphasizes areas of further research and planning.

First, the study of individual differences must continue with particular emphasis upon refining the match between client and treatment. Time in program studies are clarifying the profiles of short and long stayers, but investigation is needed into motivational variables. Evidence suggests, for example, that for some TC clients, "negative" legal and family pressures increase retention and consequent treatment outcome, while for others, a desire to change remains a "positive" pressure to stay (De Leon 1977).

Another approach toward refining the match between client and treatment is to study the spectrum of therapeutic communities and the target clientele they best serve; the latter include adolescent drug abusers, court-stipulated delinquents, troubled adolescents with minimal drug use, homeless and latency aged children, alcohol and multiple substance abusers, and women with children. Clarifying the relationship between different TCs and the clients they most successfully serve can foster development of a TC network system of cross-referral. This also has implications for impacting new client populations.

Second, future research must shift its focus to enhancing the quality of treatment by improving client management and treatment process. Most evaluation efforts have asked *whether* TCs work but few have studied *why* the therapeutic community works. This line of inquiry emphasizes treatment process, identifying the effective elements of a program, and the aspects and mechanisms of client change.

Better managed programs provide better quality treatment. Neither management nor treatment process can improve, however, without objectivity and critical self-examination. Since TCs are unique in size, style, and practices, questions of management and treatment process are best answered by individual programs. Thus, modality-wide efforts must be intensified to establish *program-based* management information and research capabilities.

Despite the changing pattern of drug abuse, the lessening of public concern, and reordering of funding priorities, the therapeutic community has endured. At present, the signs are clear. Therapeutic communities, while retaining their individual identities, are organizing around common concerns. Their intention is to assume a more visible place in the health care arena. Their increased utilization of research and evaluation, particularly in the last 3 years, reflects a consciousness changing from program survival to thriving and growth. Willing to examine themselves, TCs are aware that healthy programs should know what they are doing, understand why they work, and identify for whom they work best.

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5. Clinical Aspects of Methadone Maintenance Treatment

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INTRODUCTION

Methadone maintenance has become the most widely used and effective modality in the treatment of narcotic addiction. At present, approximately 75,000 former heroin addicts are receiving methadone daily from programs approved by the Food and Drug Administration (FDA). In order to maximize the effectiveness of treatment and to minimize possible dangers, careful thought must be given to the organization of clinics and to procedures for the provision of the medication and rehabilitative services to the patients being served. It is well recognized that the determinants of compulsive narcotic use vary according to individual and social characteristics, ethnicity, and geographical location. Program staffing and services should therefore reflect the needs of their particular populations. Methadone itself is only a tool to help achieve rehabilitation. Outcome of treatment will reflect the kind of therapeutic relationship a program staff establishes with its patients (Dole and Nyswander 1965; Dole et al. 1968; Lowinson 1969; Gearing 1971). The intention of this chapter is threefold: to describe the minimum requirements for providing adequate treatment, to discuss some of the characteristics of good programs, and to define areas of controversy in methadone maintenance treatment.

PHYSICAL FACILITIES

The facility should be sufficiently well appointed and spacious enough to serve the needs of the patients. An attractive, well-organized, and spacious clinic will encourage the development of a therapeutic milieu which may benefit both patients and staff. A pleasant clinic will enhance both staff morale and the patients' self-image. A dignified, well-run facility, attractively developed with proper lighting and temperature control, will play an important role not only in the way the patients view themselves but in the way the community at large views the clinics. A total area of 2,000 square feet for 100 patients would be ideal, but such spacious quarters are rarely available.

The space must also provide for a medical/nursing area and a counseling area. The waiting room should be in full view of the staff to encourage proper conduct among the patients. The medical/nursing area should include the nurses station, doctor's office, examining room, and bathrooms. Access to the nurses' station must be secure and limited to medical and nursing staff only. There should be secure storage for methadone—preferably narcotics cabinets with double locks. Counter space for dispensing methadone should be adequate to ensure privacy for the patient and security for the nurse. If methadone is to be stored in the clinic overnight, it will be necessary to have a safe for the secure storage of medication. Security regulations, which vary from State to State, will determine the requirements for alarm systems and safe specifications. The Drug Enforcement Administration (DEA) has final responsibility for methadone security. A consultation with the DEA staff will ensure the best security system available, as well as compliance with regulations. While good security is absolutely essential, it should not obstruct or interfere with staff-patient relations. Modern banks provide an excellent example of the compatibility of security with a pleasant, welcoming environment (Lowinson 1977). There should be two, well-lighted, clean bathrooms, one for men and one for women, in plain view of the nursing station so that nurses may exert some control over the flow of traffic.

The size of the doctor's office and examining room should ensure privacy and allow for frank discussion.

The examining room should contain a sink, an examining table, and equipment to perform a complete physical examination. The physician's assistant should have his/her own office. A well-appointed office and examining room will facilitate the medical management of patients and may also enhance the role of the doctor in the administration of the clinic and its interactions with the community.

The counseling area should include a conference room for staff meetings and patient therapy groups, as well as individual offices for the clinic administrator and each member of the counseling staff. These offices should provide privacy so that staff and patients can speak freely. Ideally, there might also be a vocational/educational area or classroom, where staff members trained in special areas can work with individual patients or with groups. There might be a recreation room or library where certain patients might play quiet games or read, but there is some question about a treatment center serving recreational needs and becoming a "hangout" for patients. Where such a facility exists, it should be closely supervised.

COUNSELING SERVICES

Severe social and psychological disability is frequently a product of the drug-dependent life. Methadone maintenance will provide the necessary pharmacological supports to alter compulsive drug-seeking behavior, but many patients will require extensive rehabilitative services (Goldstein 1972, Louria et al. 1967, Cherubin 1967).

Staffing patterns should be developed to meet the psychosocial needs of the patient. Ideally, the maximum patient-staff ratio should be 50 to 1. Where possible, each counselor should have a specialized area of knowledge which enables him to act as a resource person for other staff members. In general, the useful areas of specialization include basic adult education, vocational rehabilitation and job placement, family therapy, and legal services. A psychiatric social worker should be available to provide case supervision. A treatment plan developed with the social worker shortly after admission should be reviewed every 3 months and modified as necessary.

Each patient should be assigned a primary therapist to see on a regular basis. The frequency and duration of these contacts should be determined by each patient's needs. The first few weeks in treatment are crucial. It is during this period that a counselor can engage the patient and help him/her develop a sense of identification and responsibility toward the program. In general, addicts have had experiences leading to distrust of authority figures. Overcoming this distrust should be a major goal of the staff. Also during this initial period, the rules and regulations can be spelled out so that patients understand the necessity for them.

Counselors should adopt an attitude that is inquiring and nonjudgmental. For a relationship of mutual trust to develop, a patient must feel that staff respects and understands him. In general, efforts should be directed to the development of realistic, rewarding alternatives to drug use. Some discussions of methadone dosage or other drug use may be inevitable; however, practical, realistic discussion of jobs, school, and relationships may often prove more fruitful.

ADMISSION POLICY AND PROCEDURES

Admission criteria are established by the Food and Drug Administration (FDA) and the individual State regulatory agencies with additional criteria developed by individual programs. FDA regulations establish minimum criteria, which may be superseded by the State authority. The proposed 1978 FDA regulations specify that applicants for methadone maintenance must be at least 16 years of age and must have a verified 1-year history of addiction. Unless a patient is an emancipated minor, those under the age of 18 must have the consent form signed by parent or guardian. While the 1-year period of addiction need not be continuous, there should be convincing reasons for maintaining on methadone an individual whose addiction is of such short duration. Serious consideration should be given to long-term ambulatory detoxification or low-dose maintenance. Although there may be exceptions, it is recommended that an addicted individual make two attempts at detoxification and/or other treatment before being accepted for maintenance. A thorough history of drug use should be obtained from the patient; this should include a sequential history of all drugs (including cigarettes and alcohol) used in the past and present. In addition to the drug history, the interviewing physician should look for fresh puncture marks, old or new "tracks," and other stigmata of opiate use, as well as withdrawal signs and symptoms. A urine sample should be obtained and tested for the presence of morphine, quinine, methadone, and other psychoactive drugs. The Federal regulations do not require urine samples to be positive for narcotics prior to admission, however, a positive urine does support medical judgment that an individual is physiologically dependent on narcotics, and unless withdrawal signs and symptoms are present, a negative one implies that the applicant is not currently using narcotics (Goldstein and Judson 1973a). In general, when there is doubt about the addiction history of a particular patient, a negative urine should preclude his admission. The naloxone test has been advocated by some individuals to exclude those applicants who may meet existing physical and urine test criteria but who have little or no evidence of physical dependence. Goldstein, however, states that "when the naloxone test is conducted properly it produces mild and tolerable symptoms in dependent persons."[1]

If 0.1 mg/70 kg of naloxone administered intravenously does not produce acute signs of abstinence, the patient is not dependent. Some treatment personnel consider that an extreme measure (O'Brien et al. 1978).

The history of drug use by other family members should be obtained; treatment should be provided for any drug-using member of the family with whom the patient is living.

The voluntary nature of methadone maintenance cannot be overemphasized. Patients cannot be admitted as a basis for probation or parole, although patients on probation or parole may voluntarily apply for admission. Such applicants might not be strictly voluntary, because a person who is using drugs while on probation or parole is offered a choice between entering treatment and being imprisoned. An important issue is that a prospective patient be offered a choice of treatment modalities and that he not be coerced into a given form of treatment in accordance with the probation officer's own preference. The acceptance of patients on probation and parole involves a delicate relationship between the clinic and law enforcement agencies. In no case should reports be submitted on the patient's progress without the patient's consent, and as long as the treatment agency is prepared to continue treating the patient, the law enforcement agency should not remand such individuals to prison (Langrod et al. 1973, Newman 1970).

ADMISSION PROCEDURE

The FDA requirement of a complete medical history and physical examination as part of the admission procedure is consistent with good medical practice. These may be performed by a physician's assistant working under the direct supervision of the clinic physician. Routine laboratory tests should include a CBC with differential, SMA-12, VDRL, urinalysis, and sickle cell test when appropriate. There are many false positive VDRL's in this population; there should, however, be followup tests in dilutions of 1 4 and FTA's must be done if the latter is positive. When the FTA is positive, the patient should be treated immediately with penicillin. In addition, good medical practice, as well as public health policy, mandates reporting immediately to the local Health Department any individual who has contracted syphilis. The intake consent form signed by the patient should include a release allowing the program to transmit this information to ensure compliance with strict Federal confidentiality regulations (Cushman and Sherman 1974).

Pathology that is picked up during the admissions examination should be treated by the clinic physician, if possible. When necessary, a referral to an outside clinic should be made with followup by the clinic staff to ensure that proper treatment has been implemented.

METHADONE STABILIZATION

Induction Phase

On the basis of the initial interview, the physician should attempt to assess the patient's tolerance to narcotics. The starting dose should be in the range of 20 mg to 40 mg daily and should in no case exceed 40 mg on the first day unless the patient has been transferred from another methadone treatment program where he has been receiving a higher dose. Unless the patient has been on high doses of methadone or other pharmaceutical opiates, e.g., morphine, Dilaudid, or Demerol, it will almost never be necessary to give more than 40 mg daily during the first few days of the program. The physician sets the initial dose at a level that is sufficient to control the abstinence syndrome but is not enough to produce sedation or intoxication. It is often useful to give an initial dose of 10 mg to 20 mg and wait 3 to 4 hours; if withdrawal symptoms persist, it may be necessary to give an additional 10 mg to 20 mg. The split dosage regimen may be continued for 3 days, with adjustment when necessary, and then combined into one daily dose. During this initial induction phase, patients should be observed for signs of sedation. The dose may then be slowly raised, usually 10 mg every 3 to 4 days until the "maintenance" dose is reached. While the maintenance dose should be adequate to relieve "narcotic craving," the optimal maintenance dose is the lowest dose that is effective. Where low-dose maintenance is indicated, the dose may be raised more slowly (5 mg to 10 mg a week) (Goldstein and Judson 1973a).

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[1] A. Goldstein 1978, personal communication.

During the induction phase, patients should be required to come to the clinic five or six times a week so that they can be observed and encouraged to develop a good relationship with the program. The initial divided dose regimen will also serve these purposes. Pressing social, financial, or legal problems may be identified early and can be dealt with most effectively in the early stages of treatment while the patient is spending more time in the clinic. Problems of patients who are employed at the time of admission may be overlooked. It is recommended that the counselor attempt to see these patients at times that will not require loss of time from work.

Side effects of the medication, including constipation, peripheral edema, skin rash, and excessive sweating are usually transitory. Slowing the rate at which methadone is increased may reduce or minimize these symptoms. Loss of libido or delayed ejaculation is sometimes reported, and the physician or psychiatrist should help the patient deal with these symptoms. In general, side effects will decrease as the dose is stabilized and tolerance is acquired (Kreek 1973; Lenn et al. 1975-76; Appel and Gordon 1976; Cushman 1972; Cushman and Grieco 1973; Weissman et al. 1976).

Maintenance Phase

The dose of methadone may be maintained at any level that is sufficient to provide relief from the craving for heroin and will prevent the appearance of the "abstinence syndrome." Controversy exists as to whether so-called "low dose," which is between 30 mg and 50 mg, or "high dose," between 70 mg and 100 mg, is more effective (Lombardo et al. 1976; Goldstein 1972; Goldstein and Judson 1973b; Ling et al. 1976). The major difference is the degree of cross-tolerance to other narcotics. That is, at higher doses a sufficient degree of cross-tolerance develops so that even large doses of opiate—or even additional methadone—will not produce euphoria or overdose. This is what Dole referred to as "narcotic blockade" (Dole et al. 1966). It has also been noted that low doses are sometimes associated with the development of abstinence symptoms in less than 24 hours. This discomfort and the accompanying anxiety may predispose these patients to use alcohol, tranquilizers, sedatives, or additional narcotics. Higher doses of methadone do create a wider margin of safety. Thus, even if more than 24 hours elapse between doses, it is less likely that discomfort will develop. While detoxification from low doses may be achieved in less time, there is no evidence that the protracted abstinence syndrome will be less severe. In our experience, adult patients with long addiction histories do better on high-dose regimens. Younger patients with shorter addiction histories should be treated initially on low-dose regimens; if craving persists, it may be necessary to raise the dose, although there is some disagreement with this point of view. Conditioned craving may be present even with the highest dose. In all cases, the dose of methadone should be compatible with the comfort of the individual patient. If the dose is too high, sedation or lethargy will prevent normal functioning. If a patient is not comfortable, he/she may turn to alcohol or other drugs. Improper doses may, therefore, be a contributing factor to polydrug abuse (Stimmel et al. 1978; Woody et al. 1975; Brown et al. 1973; Bihari 1974; Maddux and Elliott 1975; Liebson et al. 1973; Schut et al. 1973; Stimmel et al. 1972).

Urines are collected once a week on random days until the patient has been on the program for 3 months, and once a month thereafter unless the patient has a positive urine for an illicit drug or has not taken his methadone, at which time he reverts to once a week for 3 months. This is mandated by the Food and Drug Administration. There has been some discussion on whether the value of urine testing justifies its expense, especially since some patients regard the testing as demeaning and the tests are not always accurate (Gearing 1972; Riordan et al. 1972). However, many patients claim that urine testing not only reinforces their decision to remain "clean" but is evidence that the staff is concerned about their progress (Nightingale et al. 1972).

After a patient has demonstrated a commitment to the rehabilitative process as evidenced by consistent attendance, absence of drug abuse, and social or educational rehabilitation, the pick-up schedule may be liberalized and he/she may be given some take-home medication. One must verify the social and vocational status of the patient by requiring pay stubs or similar evidence of involvement with the rehabilitative process. This initial period may last from 3 months to a year depending on the individual circumstances. After this period, the patient may be allowed to come to the clinic three times weekly. The decision to reduce frequency of clinic visits must be made by the physician in conjunction with the recommendations of an interdisciplinary staff. Where possible, responsible ex-addict staff members should also participate in such decisions (although there is some disagreement on this point). The responsibility involved in 1 or 2 days of "take home" medication should be impressed upon each patient. Continued progress may indicate a further reduction in the pick-up schedule—to once or twice a week depending on the circumstances. It is absolutely essential that patients understand the dangers that methadone may present to a child or other nontolerant individuals. A policy of "no take home" is associated with lower retention rates as well as with higher unemployment (Dole et al. 1971).

The consequences of diversion of methadone must be taken into consideration; however, the needs of the individual patient must be weighed against the responsibility to the community at large (Goldstein and Judson 1973a). Carefully regulated and supervised "take-home" is indicated for responsible patients if their independence is to be encouraged. It is possible that levo-alpha-acetylmethadol (LAAM), which extends the duration of opiate action to 72 hours after an oral dose, will be employed for those patients who no longer need the intense involvement with the clinic but who are not considered responsible to handle take-home medication. This is discussed in a separate chapter.

PREPARATION AND DISPENSING OF METHADONE

Methadone may be obtained in disket form (Eli Lilly), tablet form (Westadone by Vitarine), or powdered form (Mallinckrodt). The diskets are supplied as 40 mg tablets that can be broken into 10 mg quarters; Westadone tablets come in 2 mg, 5 mg, and 10 mg which are particularly useful for detoxification. Programs that utilize diskets or tablets usually have them delivered directly to the clinic's nursing station, where the individual doses are prepared by dissolving the diskets or tablets in water. A palatable liquid is added to the dissolved methadone for consumption in the clinic. Programs that utilize the powdered form usually have the individual doses prepared by a pharmacist in a secure, well-equipped pharmacy and then transported to the program for dispensing to patients. However, greater accountability can be achieved with diskets and tablets, and the powdered form no longer has any real advantage.

The nurse must observe a patient carefully to ascertain that he has, in fact, swallowed the medication. Each bottle of take-home medication must be individually labeled with the date, the name of the patient, the program, and the prescribing physician. There should also be a label warning that this medication may be lethal if taken by anyone other than the patient. All take-home methadone should be dispensed in child-proof bottles. Although methadone was originally dispensed in an orange-flavored breakfast drink (both to counteract its bitter taste and to prevent intravenous use), the omission of sweeteners has the double advantage that it need not be refrigerated, so it can be kept in a locked container out of the reach of children, and that the bitter taste would virtually eliminate any accidental use of medication. State and local requirements as to exact preparation, dispensing, labeling, and security procedures may vary. These requirements should be checked carefully.

Patients with take-home medication should return each bottle to the nursing station before further take-home medication is dispensed. Each clinic should develop a procedure for adequate disposal of empty bottles.

MEDICAL CONSIDERATIONS

Patients on methadone may experience medical problems similar to those found in the general population. After 10 to 14 years of followup studies in adult patients, no toxic or serious adverse effects due to methadone itself as used in chronic treatment have been documented (Kreek 1978).

A variety of side effects due to methadone itself have been observed in some patients (Kreek 1978). Many of these are observed only in the early months of treatment and are simply well-documented narcotic effects. Tolerance to the various narcotic effects develops at different rates, so that drowsiness, euphoria, and some somnolence may be observed in maintenance patients when the methadone dose is increased too rapidly.

Ankle edema and skin rash are transient effects seen occasionally. Chronic constipation is a frequent side effect, though this usually responds to conservative measures. Sweating is also reported but usually subsides with a slight reduction in the dose. Symptoms and signs of decreased libido and impaired sexual functioning are difficult to evaluate since sexual dysfunction is common in the general population and comparison with results of contrast groups matched for demographic characteristics with the ex-addict group have not been reported. It is possible, but not proven, that decreased libido and sexual

61

function are real side effects of methadone maintenance in some people.

In general, health and nutritional status improve in most patients during successsful methadone treatment. Most medical complications are due to causes unrelated to the methadone itself. The single most common cause of medical complications seen in patients during methadone treatment is alcohol abuse.

The most common types of hepatic dysfunction, as documented by liver biopsies in some studies, are the chronic sequelae of acute viral hepatitis and, in those patients with a drinking problem, alcoholic hepatitis, alcoholic fatty liver, or alcoholic cirrhosis, which may occur separately or concurrently. In several population studies, between 16 percent and 50 percent of all patients in methadone maintenance were identified as chronic abusers of alcohol. Most of these patients had a history of drinking often predating their use of heroin. This group is likely to resume alcohol abuse after entering methadone treatment (Stimmel et al. 1972, 1978; Brown et al. 1973; Bihari 1974; Maddux and Elliott 1975; Liebson et al. 1973; Schut et al. 1973).

Some drugs alter the metabolism and disposition of methadone; for example, rifampin lowers plasma methadone levels and this may produce withdrawal symptoms. There is no evidence that methadone or alcohol influences the disposition of the other. Taking the two drugs together does, however, may result in enhanced intoxication. Since many methadone patients have had hepatitis, their livers may suffer added insult from alcohol.

Stabilization on methadone is associated with tolerance to most narcotic effects of methadone itself, including tolerance to its analgesic effects. When a methadone patient experiences pain or undergoes surgery, clinicians should use whatever dose of an opiate is required to produce analgesia; in severe pain and in the face of a high methadone dosage, the amount required to break through the cross tolerance may be very large. Pentazocine (Talwin) is one medication that is absolutely contraindicated for patients on methadone; the antagonist properties of the drug can throw a methadone patient into severe withdrawal. All patients should be informed of the effects of Talwin. It should not be assumed that all physicians or dentists know the above facts. Therefore, it is advisable for physicians and dentists consulted by methadone patients to communicate with a physician in a methadone maintenance clinic. Consent forms, signed at the time of admission, should include a paragraph to this effect. Patients should also be instructed to advise any private physicians they may consult of their methadone treatment.

PREGNANCY

Up to 90 percent of female heroin addicts have secondary amenorrhea or, at least, irregular menses. In general, after several months of methadone maintenance, with the improved nutrition and greater regularity of everyday life, the menses return to normal. Women of child-bearing age therefore, are, likely to become pregnant while being maintained on methadone.

It is recommended that a pregnant woman be maintained on the lowest possible dose of methadone to keep her comfortable and help her abstain from abusing alcohol and other drugs. This will reduce the incidence and extent of withdrawal symptoms in the baby. If not conducted properly, reduction of dose and detoxification carry with them certain dangers. Reduction of the dose during the first trimester may result in abortion; in the last trimester, premature labor may be precipitated. Some studies indicate that dose reduction should be made between the fourteenth and twenty-eighth weeks and should be done as gradually as possible, perhaps 5 mg to 10 mg every 2 weeks (Finnegan 1978).

The normal stress many women experience during pregnancy often may be significantly greater in methadone-maintained women. This results from complex psychosocial factors. It is necessary for staff to be supportive and work towards the development of increased structure in the lives of these women. Pregnant patients should be asked about other drug use, particularly extra methadone, tranquilizers, or alcohol. Careful planning for the support of the baby and related issues will do much to allay the anxiety.

Infants of methadone-maintained women who receive good prenatal care are comparable in health to those of nonaddicted mothers receiving similar care. In one study, the mean birth weight of babies born to methadone-maintained mothers was slightly less (2930 g) than that of nonaddicted mothers (3200 g) and considerably higher than those of mothers addicted to heroin (2500 g) (Kandall et al. 1975). Since both methadone and heroin mothers are heavy smokers, and it is known that chronic smoking is associated with intrauterine growth retardation, lower birth weight may be attributed in part to the smoking effect. Withdrawal symptoms in the neonate are seen in four systems: the CNS, gastro-intestinal, respiratory, and autonomic nervous system. If the symptoms are mild, they are usually controlled with supportive measures (soft lights, quiet environment, and swaddling); if they are moderate or severe, paregoric (0.2 ml q3h) can be administered by mouth. If relief is not obtained, the dose of paregoric may be increased by 0.50 ml. Rarely, it is necessary to increase the dose to 0.75 ml. The dose of paregoric must be tapered slowly to avoid the recurrence of withdrawal symptoms (Kandall et al. 1975).

PSYCHOPATHOLOGY

It is difficult to assess the severity of psychopathology that existed before compulsive drug use began. However, a large percentage of patients who enter methadone maintenance treatment exhibit little or no psychopathology. Methadone may unmask psychopathology in patients who appear "normal" on heroin. A small percentage with severe psychopathology require a great deal of time and energy from the staff. Ideally, methadone treatment programs should have a staff psychiatrist. Psychotropic medication is often indicated, but because of side effects and slow onset of action, is generally not acceptable to the patients (Kleber and Gold 1978). Many methadone patients began using opiates and other drugs as self-medication. To compound the problem, psychiatric hospitals are often reluctant to admit patients with a history of drug use for a variety of reasons, even when they are in obvious need of hospitalization. Clearly, programs should have the services of psychiatrists and well-trained psychiatric social workers who can make reliable diagnoses. Where brief therapy is indicated, it may be desirable for a supervised clinic to provide it. For long-term therapy, there should be referral to psychiatric clinics or community mental health centers capable of providing this service.

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6. Methadone in Treatment: Physiological and Pharmacological Issues

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During the 14-year interval since Dole and colleagues at The Rockefeller University first began research in the use of chronic maintenance with the long-acting narcotic, methadone, as a treatment for heroin addiction, many reports concerned with the medical status of and adverse effects in patients receiving methadone have appeared (Dole et ,al. 1966; Dobbs 1971; Kreek 1972, 1973a, 1978b; Kreek et al. 1972; Jaffe et al. 1973; Martin et al. 1973; Scott et al. 1973; Gritz et al. 1975; White 1975). These have included both descriptions of clinical observations and reports of prospective and retrospective studies of patients at time of admission and during chronic treatment with methadone. Both types of reports have primarily described the multiple medical complications of opiate addiction which are present in patients at time of admission to methadone-maintenance treatment, many of which persist for years or even indefinitely during chronic treatment. These studies have provided both intriguing clues and well-documented information concerning the physiological effects of long-term narcotic use in man, and have fostered the performance of more controlled studies of these possible drug effects, both in man and in animal models. Although some insights into the physiological effects of chronic narcotic use have been acquired initially from basic research in animals, more often such studies have been designed to study acute and subacute, but not chronic, effects.

During the last 5 years, rapidly developing analytical technology has made possible for the first time careful studies of narcotic disposition in animals and in man. Thus, it is now sometimes feasible to relate observed physiological effects to the levels of available narcotic. Finally, in the last 5 years, there have been exciting discoveries of specific opiate receptors, now positively identified both in the brain and in the intestine of many species, including man, and of the endogenous ligands, generally referred to as endorphins. Within the next decade it will become possible to correlate information concerning disposition of exogenous narcotic with endogenous neuroendocrine function of primary opiate receptor-ligand interactions, endorphin synthesis, and possible peripheral actions, and to correlate the physiological effects of both exogenous opiates and endogenous endorphins and related substances.

GENERAL COMMENTS ON PHYSIOLOGICAL AND PHARMACOLOGICAL EFFECTS OF NARCOTICS

When discussing the recent findings concerning the physiological effects of methadone in man when used on a chronic basis, it is important to delineate the acute (or subacute) effects of a narcotic agent administered to a naive or nontolerant individual from the chronic effects of a narcotic given to an individual who has developed tolerance (of varying degrees) to narcotics. With repeated administration to humans of a narcotic drug, the various effects of the drug change, so that for a given dose the effects are progressively less with time; thus, tolerance to the drug develops. It is also important to distinguish between the effects of a short-acting narcotic, such as morphine or heroin, from a long-acting narcotic, such as methadone or l-α-acetylmethadol. Much of the confusion which now exists in the clinical and research literature regarding the physiological effects of methadone used in chronic treatment has resulted from a failure to differentiate acute and chronic effects of short- and long-acting narcotic drugs.

Tolerance develops at different rates to the diverse narcotic effects observed in man. However, no anatomical, biochemical, or physiological explanations of the development of tolerance have been validated, nor are there precise explanations as to why tolerance develops at different rates to the different narcotic effects. Because of development of tolerance, increasing amounts of narcotic must be used to achieve the desired effect, such as analgesia (for patients in pain) or euphoria (for the street addict). Along with tolerance, physical dependence on narcotics develops in humans receiving narcotics on a chronic basis. The exact time or dose requirement for the development of physical dependence has not been defined and undoubtedly will depend in part on the physiological indices used and degree of abnormality demanded for the definition of physical dependence. However, the clinical syndrome of narcotic withdrawal has been well characterized and widely recognized.

Acute effects of morphine, a short-acting narcotic which is also the major metabolite of heroin, include analgesia, somnolence, characterized by an inability to concentrate coupled with drowsiness; and changes in mood, either euphoria or dysphoria. The latter is common, both in patients and in new drug abusers, and is characterized by anxiety and fear. Apathy, decreased physical activity, and lethargy are also acute narcotic effects. Respiratory depression occurs due to decrease in responsiveness of brain-stem respiratory centers to increases in PCO_2 and to hypoxia, and results in decreased respiratory rate, minute volume, and tidal exchange. With increasing doses of narcotic, this may lead to irregular respiration, pulmonary edema, and respiratory arrest. Respiratory depression is the most common toxic effect of narcotics and may occur even in moderately tolerant individuals if enough narcotic is administered. Other acute effects of morphine on the central nervous system result in depression of body temperature, constriction of pupils, stimulation of the chemoreceptor trigger zone of the area postrema to produce nausea and vomiting, and EEG changes characteristic of natural sleep. Acute administration of morphine also may result in alterations in neuroendocrine function with inhibition of release of adrenocorticotrophic hormone (ACTH), follicle-stimulating hormone (FSH), and luteinizing hormone (LH), with resultant decrease in peripheral release of adrenal, cortical, and gonadal steroids; stimulation of release of antidiuretic hormone (ADH) with resultant water retention and decreased urine output, and stimulation of release of prolactin.

There are minimal significant acute effects of usual therapeutic doses of morphine on the cardiovascular system. These may be mild orthostatic hypotension, possibly secondary to peripheral vasodilation, and mild bradycardia. Significant EKG changes do not occur. Cerebral circulation is not directly affected by morphine, although carbon dioxide retention secondary to respiratory depression may result in cerebral vasodilation and increase in cerebral spinal fluid pressure.

Morphine has multiple acute effects on the gastrointestinal tract, including decreased gastric acid secretion, decreased gastric motility with increased tone of the antrum and first portion of the duodenum, resulting in delayed gastric and duodenal passage of contents; increased resting tone and spasmodic contractions of the small and large intestine with increased amplitude of nonpropulsive rhythmic contractions and marked decrease in propulsive type of rhythmic contractions; and increased anal-sphincter tone. These effects result in marked decrease in rate of passage of intestinal contents with increased water reabsorption, resulting in desiccation of feces. The biliary tract is also affected, with increase in tone of the sphincter of Oddi and increased pressure within the common bile duct.

Acute effects of morphine on the genitourinary tract include increases in tone and amplitude of contraction of ureters, increase in tone of bladder detrusor muscle resulting in urgency, and increase in tone of the vesical sphincter resulting in urinary retention. Acute administration of morphine may affect uterine muscle and prolong labor.

Morphine, as well as other narcotics, is a powerful releaser of histamine. Cutaneous vasodilation and pruritus may result. Increased sweating, observed after morphine administration, may be related to histamine release and vasodilation.

The acute effects of the long-acting narcotic, methadone, in naive or nontolerant subjects are similar to those of morphine, with the exception that methadone in usual therapeutic morphine doses causes less somnolence than morphine. However, because of its longer duration of action, cumulative effects are observed on repeated administration of this drug during chronic usage.

When a narcotic is used on a repeated basis, either in the clinical setting for relief of pain or in the setting of drug abuse, tolerance develops at varying rates to most or all of these acute narcotic effects until they can no longer be elicited unless increasing doses of narcotic are used.

If chronic use of narcotics is abruptly stopped, the narcotic-abstinence syndrome will ensue with onset of symptoms within 8-12 hours after the last dose of narcotic. The early symptoms of narcotic withdrawal include lacrimation, rhinorrhea, yawning, perspiration, restlessness, and irritability followed by a restless or so-called "yen" sleep. Approximately 20-24 hours after the last dose of narcotic, increases in each of these signs and symptoms of withdrawal occur along with coryza, anorexia, vomiting, nausea, diarrhea, abdominal cramps, bone pains, myalgias, tremors, weakness, insomnia, and (rarely) convulsions. These symptoms may be prevented or abated by administration of a short- or long-acting narcotic. Gradual detoxification can be carried out using decreasing doses of a long-acting narcotic such as methadone over a 7-14 day period. However, after either abrupt or detoxified withdrawal, nonspecific signs and symptoms persist which are identified by the former addict as "drug hunger" and which may send him back to opiate abuse.

The signs and symptoms of "drug hunger" may be related in part to the syndrome of protracted abstinence, which has been described by Martin and Jasinski (1969) in former narcotic addicts. During the first 4-10 weeks following narcotic withdrawal, increased blood pressure, pulse rate, body temperature, respiratory rate, and pupillary diameters were observed. A second "protracted" phase emerged 6-9 weeks after narcotic withdrawal and persisted through the 26th to the 30th week; it was characterized by decreased blood pressure, pulse rate, body temperature, and pupillary diameter. Goldstein (1976) has recently suggested that the immediate and protracted abstinence syndromes may be due in part to an induced endorphin deficiency following the removal of the exogenous narcotic, such as the syndrome of adrenocortical insufficiency that follows the sudden withdrawal of exogenous corticosteroid administration.

Heroin, like morphine, must be administered intravenously to be fully effective, whereas methadone and l-α-acetylmethadol may be administered orally. An intravenous injection of heroin is effective immediately and remains effective for 3-6 hours, whereas after oral ingestion methadone does not become active until after 30-90 minutes, and its duration of action during chronic daily administration is 24-36 hours. After intravenous administration of heroin in a patient with physical dependence, euphoria may be experienced for 1-2 hours if the dose administered is sufficent to prevent narcotic withdrawal for 3-6 hours. After the oral administration of methadone, no euphoria or narcotic effect is experienced other than prevention of withdrawal symptoms and "drug hunger" unless the dose administered exceeds the degree of tolerance of the individual. During chronic usage, withdrawal symptoms from heroin begin to appear 3-4 hours after the last dose, whereas withdrawal symptoms from methadone do not appear in most individuals until more than 24 hours after the last dose. l-α-acetylmethadol has an even longer duration of action when administered on a chronic basis because of the prolonged effectiveness of its two pharmacologically active N-demethylated metabolites.

Methadone has been effective in chemotherapeutic treatment programs for drug abuse, which combine absence from illicit drug abuse and rehabilitation, because of its pharmacologic and physiologic properties preventing the withdrawal syndrome and persistent "drug hunger" when administered orally once daily on a chronic basis in appropriate doses which do not cause somnolence or euphoria in tolerant individuals. Use of moderate to high doses of methadone also provides a degree of cross-tolerance to other narcotics sufficient to "blockade" or prevent their euphorogenic effects if they should be self-administered.

METHADONE DISPOSITION IN MAN

Over the past few years, sensitive and specific gas liquid chromatographic techniques for measuring levels of methadone and its major metabolites in plasma, urine, and other body fluids including amniotic fluid, breast milk, sweat, bile, gastric juice, saliva, semen, and tissue extracts have been developed, modified, and improved in several laboratories (Robinson and Williams 1971; Sullivan and Blake 1972; Inturrisi and Verebely 1972a; Baselt and Casarett 1972; Henderson and Wilson 1973; Kreek 1973b; Inturrisi and Blinick 1973; Kreek et al. 1974b; Horns et al. 1975; Lynn et al. 1976; Gerber and Lynn 1976; Bellward et al. 1977; Kreek et al. 1976). Of especial importance in carrying out balance studies in human subjects has been the development and improvement of methods for the quantitative analysis of methadone and its metabolites in feces using extracts of fecal homogenates (Kreek et al. 1976; Kreek et al. 1977; Anggard et al. 1975; Verebely et al. 1975). Using these methods, plasma or whole-blood levels of methadone have been measured in naive and methadone-maintained subjects, levels of methadone in tissues have been measured in autopsy specimens from individuals who died from an apparent overdose of narcotics (Robinson and Williams 1971; Sullivan and Blake 1972; Inturrisi and Verebely 1972a; Kreek 1973b, 1975; Kreek et al. 1978; Horns et al. 1975; Gerber and Lynn 1976; Kreek et al. 1976; Anggard et al. 1975; Verebely et al. 1975; Inturrisi and Verebely 1972b,c; Dole and Kreek 1973).

In most reports of plasma levels, methadone alone, but none of its metabolites, has been detected and measured in peripheral plasma. Peak plasma levels of methadone in maintenance patients occur at 2-6 hours after an orally administered full daily dose of 20-120 mg. In patients receiving high doses of 80-120 mg per day of methadone, the reported peak plasma levels range from about 0.4 to 1.60 µg per ml. The plasma levels at 24 hours after these oral doses range from about 0.15 to 1 µg per ml. It has been postulated that a large reservoir of methadone, nonspecifically bound in tissues and in equilibrium with methadone in plasma, must exist to account for these relatively low peak levels and relatively high steady-state levels at 24 hours after a dose (Dole and Kreek 1973). Such a concept would also explain why a patient well established on moderate- to high-dose methadone maintenance can be given half or twice the usual maintenance dose on any one day without a seriously altered clinical response, and yet would experience increasingly severe abstinence symptoms, or narcotic effects such as somnolence, if such a dose were continued for 2 or 3 days (Dole et al. 1966; Verebely and Kutt 1975). Over the past several years, many patients on methadone-maintenance treatment have been electively or mandatorily detoxified from methadone. It has been observed repeatedly that a slow detoxification schedule of several weeks to months must be followed to prevent mild but debilitating abstinence symptoms (Kreek 1975). The rate of change of plasma levels and tissue stores of methadone seems to be more important and better correlated with changes in clinical symptoms and physiological findings than the absolute levels, as evidenced in recent studies of the interaction of the antituberculosis drug, rifampin, with methadone (discussed below) and in studies of the effects of omission of a single dose of methadone in maintained patients (Verebely and Kutt 1975; Kreek et al. 1976a). Further, in patients on steady doses of methadone in maintenance treatment, little correlation between plasma levels of methadone, determined at 24 hours after the last dose, when they should be at the lowest level, and clinical symptoms were observed in one study (Horns et al. 1975). The mild symptoms of narcotic abstinence experienced by many patients following complete detoxification from methadone, which have persisted for long periods of time, may be related to suppression or alteration in negative feedback control of endogenous endorphin synthesis or release, and also may be related in part to a slow disappearance of all active drug and drug metabolites from tissue reservoirs. Similarly, the development of tolerance to, and dependence upon, narcotic drugs may in part depend on the continued availability of a drug, or an active metabolite, on a chronic basis to critical receptor sites. Successful pharmacological maintenance treatment for narcotic addiction may depend on such sustained drug availability, coupled with continued effectiveness of the drug and lack of development of tolerance to essential actions which prevent abstinence symptoms and "drug hunger."

Several years ago, it was shown that very small amounts of morphine remain in rat brain for extended periods of time (up to at least 3 weeks) after a single dose (Misra et al. 1971). More recently, it has been shown that very small but probably significant amounts of methadone persist in the brain of both rats and dogs for up to 3 weeks (Misra and Mulé 1972, 1973; Misra et al. 1974). In the dog, it was also shown that radioactivity from the administered drug persisted in liver, spleen, lung, and bile for at least 3 weeks (Misra et al. 1974, 1975). In recent studies, it has been shown that small but probably physiologically active amounts of unchanged methadone persist in multiple organs, including the brain, liver, intestine, and testes-vas deferens, for at least 10 weeks after a single radiolabeled dose (Harte et al. 1976). These findings support the hypothesis that methadone persists in tissues for prolonged periods of time, creating a nonspecific reservoir which sustains plasma levels and physiological effects.

The metabolic fate of methadone in man has been studied, and several metabolites have been identified in urine and feces using a variety of techniques including solvent partition, thin layer and column chromatography, gas chromatography, and mass spectrometry (Kreek et al. 1976a; Kreek et al. 1977; Anggard et al. 1975; Verebely et al. 1975; Beckett et al. 1968; Pohland et al. 1971; Sullivan et al. 1972a; Sullivan and Due 1973; Bowen et al. 1978; Sullivan et al. 1972b). The liver is the primary site for biotransformation of methadone, although the intestinal mucosa and lung may also metabolize this drug. The major metabolic pathway for biotransformation of methadone in man is initial N-demethylation followed by immediate cyclization of this unstable intermediate to form a pyrrolidine, the major metabolite found in urine and the major product from methadone excreted in human feces (Sullivan and Blake 1972; Inturrisi and Verebely

1972a, Baselt and Casarett 1972; Kreek 1973, Kreek et al. 1976a, Kreek et al. 1977, Bowen et al. 1978). A second N-demethylation then may occur to transform the pyrrolidine into pyrroline, a minor metabolite which has been measured in human urine using gas chromatographic techniques (Sullivan and Blake 1972; Inturrisi and Verebely 1972a; Kreek 1973; Kreek et al. 1976a). Hydroxylated derivatives of both the pyrrolidine and pyrroline metabolites have been isolated from human urine. This major and also several minor pathways of methadone metabolism in humans on maintenance treatment have been well-delineated by Sullivan and coworkers and confirmed in large part by others (See figures 1 and 2.) The other minor pathways include initial hydroxylation to form hydroxymethadone; initial oxidation to form dimethylaminodiphenylvaleric acid, which then undergoes N-demethylation and cyclization to form a pyrrolidone; and initial reduction of the ketone group to form a methadol (which [illegible] not been isolated from human urine or feces after methadone administration), which is then N-demethylated to form N-demethyl methadol (normethadone), which has been isolated from the urine of patients on maintenance treatment (Sullivan and Due 1973). The final pathway is potentially significant, since it has been shown that methadol and its nor- and nor-nor derivatives are pharmacologically active and have a very long duration of action (Sullivan et al. 1972b). The active l-isomer of methadol is derived from the inactive d-isomer of methadone. Methadone is given as the racemic mixture in clinical usage. It has been generally assumed that only the l-isomer possesses significant biological activity in man. However, it is possible that during chronic maintenance treatment the d-isomer might also play a significant pharmacological role by biotransformation to the l-α-methadol metabolites.

Recently, it has been documented that the pyrrolidone compound is a major oxidative degradation product from pyrrolidine and may be regularly observed in the laboratory if pyrrolidine is kept as the free base for any extended period of time (Kreek et al. 1976b; Bowen et al. in press). Thus, the pyrrolidone formed in human feces may simply be an artifact due to degradation of pyrrolidine in the gastrointestinal tract or during the chemical analytical procedures.

Extent of excretion of methadone and the major pyrrolidine and minor pyrroline metabolites in human urine have been studied using gas chromatographic techniques to measure levels of each (Sullivan and Blake 1972; Inturrisi and Verebely 1972a; Baselt and Casarett 1972; Kreek 1973b; Inturrisi and Verebely 1972b,c; Sullivan and Due 1973). In one study of patients in chronic methadone-maintenance treatment, urinary levels of methadone and the major pyrrolidine metabolite 24 hours after a 100-mg oral dose ranged from 5.2 to 63.3 µg per ml and 3.2 to 52.2 µg per ml, respectively, with mean levels of 22 µg per ml for each in patients with urinary pH levels less than 6 (Kreek 1973b). However, in maintenance patients with urinary pH levels greater than 6, methadone levels in urine ranged from 1.1 to 5 µg per ml and major metabolites from 1 to 14.2 µg per ml. Dependence of methadone and pyrrolidine metabolite excretion on urine pH levels could be predicted from the pKa values for these two compounds (Baselt and Casarett 1972; Kreek 1973b; Bellward et al. 1977; Inturrisi and Verebely 1972b, c). It has been shown that other narcotics are partially reabsorbed by the kidney and that this reabsorption is pH dependent (Fujimoto 1971). Thus, with a lower urinary pH, reabsorption by the kidney might be reduced. Calculations of renal clearance of methadone based on 4-hour collections (hours 4-8 after a dose of methadone is administered) were made in naive subjects with urinary pH less than 6 after receiving a single dose of methadone, and ranged from 10.9 to 15.6 ml per min, in maintenance patients, clearances ranged from 9.5 to 46.5 ml per min. These calculations were based on the assumptions that glomerular filtration was in normal range during the clearance study period and that methadone is not extensively bound to plasma proteins, or at most is albumin bound. The second assumption proved not to be correct. Subsequent studies have shown that in therapeutic concentrations in plasma, methadone is 22-44 percent bound to human plasma albumin at physiological concentrations of 4 to 5 gm per 100 ml and is also 7-17 percent bound to gamma globulin at physiological concentrations (Olsen 1972, 1973; Judis 1977). Binding of methadone to alpha$_1$, alpha$_2$, and beta globulins also occurs (Olsen 1973; Judis 1977). Recalculations of renal-clearance data using the plasma protein binding data and following the assumption that only free drug is available for glomerular filtration suggest that urinary clearance of methadone is six to eight times greater for both acutely and chronically treated individuals than had been calculated originally (Olsen 1973). It has been shown that most patients in methadone maintenance have elevated levels of all globulin fractions of plasma proteins and many have elevated levels of serum albumin, both at time of admission to and during treatment (Kreek et al 1972; Kreek 1973a). In subsequent studies to be discussed below, using a rabbit model, it has been shown that chronic methadone treatment results in increased albumin

FIGURE 1.—*Major pathway of dl-methadone metabolism in man. Adapted from Sullivan, H. R., and Due, S. L. J Med Chem, 16:910, 1973. Compounds 1, 2, and 3 are major products excreted in human urine.*

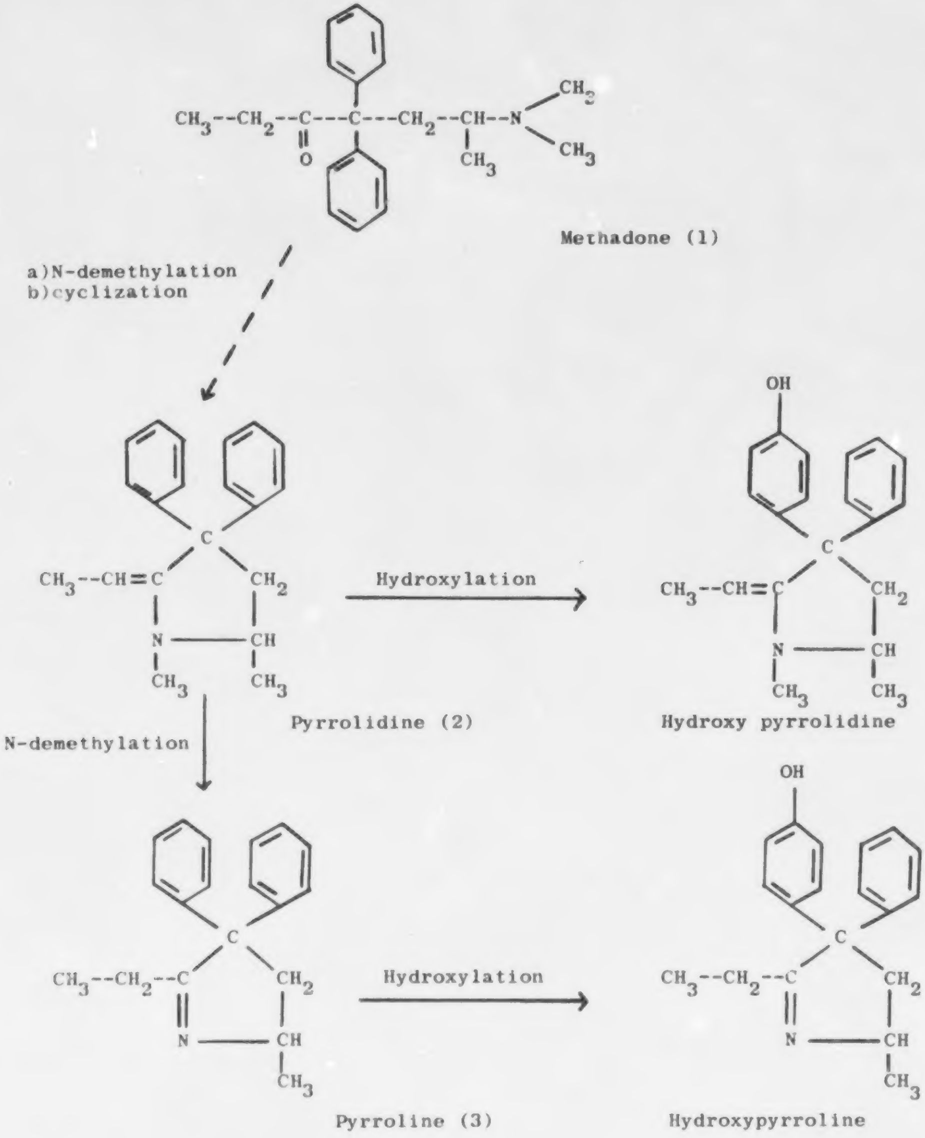
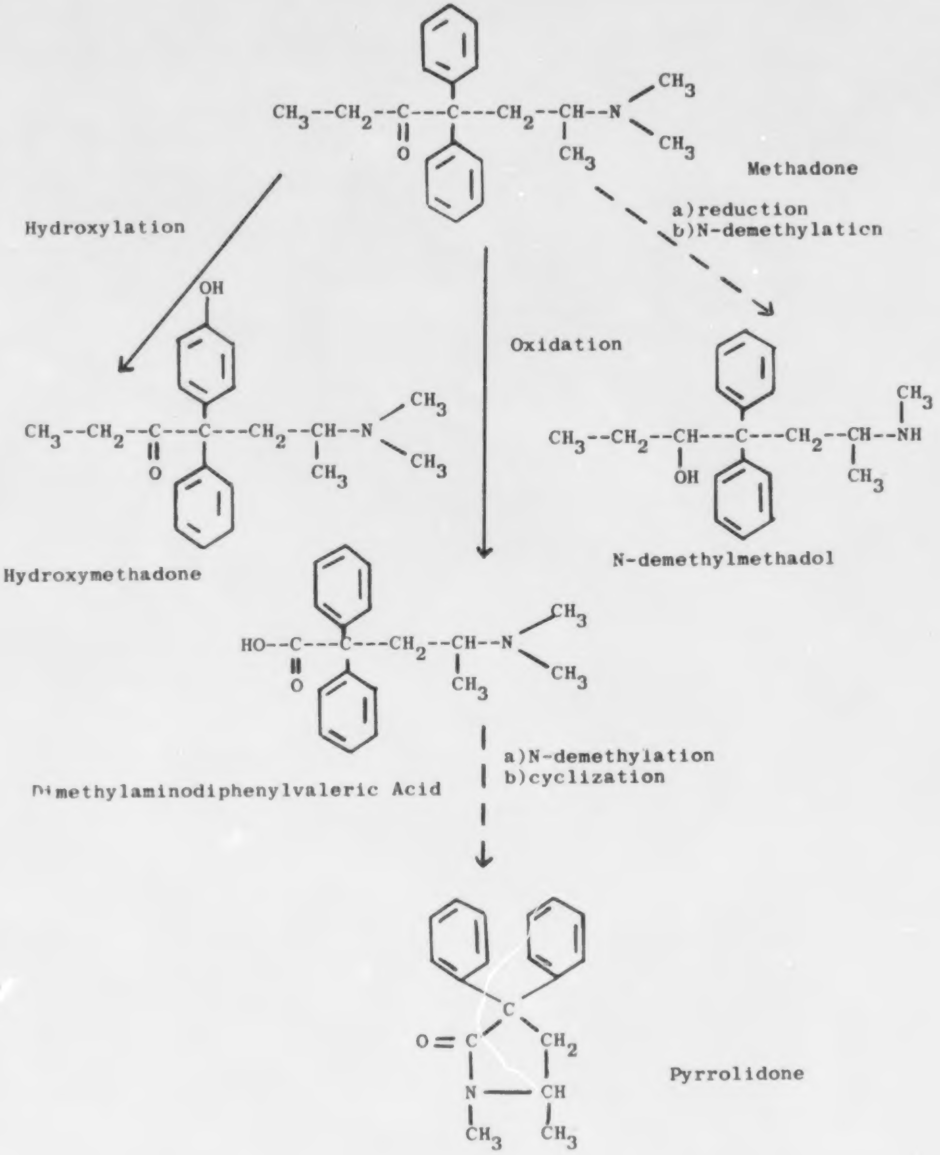

Methadone (1)
a)N-demethylation
b)cyclization
Pyrrolidine (2)
Hydroxylation
Hydroxy pyrrolidine
N-demethylation
Pyrroline (3)
Hydroxylation
Hydroxypyrroline

FIGURE 2.–*Minor pathways of dl-methadone metabolism in man. Adapted from Sullivan, H. R., and Due, S. L. J Med Chem, 16:910, 1973.*


Methadone
Hydroxylation
Oxidation
a)reduction
b)N-demethylation
Hydroxymethadone
N-demethylmethadol
Dimethylaminodiphenylvaleric Acid
a)N-demethylation
b)cyclization
Pyrrolidone

synthesis with sustained elevation of albumin levels in the intravascular and extravascular compartments (Rothschild et al. 1976). Thus, increased plasma protein concentrations and presumably increased availability of sites for binding of methadone in maintenance patients might reduce the amount of methadone available for glomerular filtration. In most studies of urinary excretion of methadone and its measured metabolites, less than 50 percent of an orally administered daily dose of 80-120 mg, or a much smaller acute dose, is recovered in urine within 24-96 hours after the dose is administered (Sullivan and Blake 1972; Inturrisi and Verebely 1972a,b,c; Kreek 1973b; Sullivan and Due 1973).

Excretion of methadone and the pyrrolidine and pyrroline metabolites in human sweat has also been reported (Henderson and Wilson 1973). The concentrations of unchanged methadone in sweat (1.4 to 2.6 µg per ml) in five maintenance patients receiving 70 mg methadone each day were comparable to the concentrations observed in the urine of these patients (0.8 to 5.6 µg per ml). However, these urine concentrations were much lower than those observed by other investigators in patients with urinary pH levels less than 6 and are comparable to urine levels observed in patients with urine pH greater than 6. Since urinary pH levels were not recorded in the report comparing sweat and urine levels, it is possible that these urine pH levels were high and that relatively greater amounts of methadone were excreted in sweat than might occur if urine pH was less than 6. Proportionately less of the pyrrolidine and pyrroline metabolites were excreted in sweat than in urine (Henderson and Wilson 1973). If normal sweat volume is around 500 ml per day as suggested, appreciable amounts of methadone may be eliminated by this route, especially since chronic excessive perspiration is a well-established clinical finding in patients maintained on methadone (Kreek 1973a; Henderson and Wilson 1973).

Since the amounts of methadone and metabolites excreted in urine and in sweat total less than 50 percent of an administered dose in most cases and less than 75 percent in essentially all cases, it was apparent that the fecal route of administration must be an important one in man. Large amounts of methadone and its metabolites have been detected in bile of users and abusers of methadone at postmortem examination (Robinson and Williams 1971). Quantitative methods for the measurement of methadone and major metabolites in feces using gas chromatography have recently been developed along with chemical ionization/mass spectrometry techniques for the qualitative analysis of other metabolites in feces (Kreek et al. 1976b, Kreek et al. 1978; Bowen et al. in press). These techniques, along with radioisotope tracer techniques, have provided data that 10-45 percent of an administered dose of methadone is excreted by the fecal route in maintenance patients, and that the fecal route becomes the major and often sole route of excretion in altered states of physiology such as severe chronic renal disease (Kreek et al. in press).

Extensive studies of methadone disposition and pharmacokinetics in man have been limited because of the lack of sufficiently sensitive and specific methods to perform the requisite measurements coupled with the complexity of the patient population to be studied. In early studies, the plasma half-life of methadone in maintenance patients was estimated from plasma-level data and ranged from 13 to 47 hours with a mean of about 25 hours (Inturrisi and Verebely 1972b; Dole and Kreek 1973). The calculated apparent plasma half-life for methadone in naive subjects receiving a single 15-mg dose, orally or intramuscularly, ranged from 10 to 18 hours with a mean of about 15 hours (Inturrisi and Verebely 1972c). In a more recent study, the apparent plasma disappearance curve of methadone showed both a fast component (t½ 14 hours) and a slow component (t½ 55 hours) on the second day of methadone treatment following a 15-mg dose. After 26 days of treatment with a final dose of 80 mg, there was a single component with an apparent half-life of methadone of 22 hours (Misra and Mulé 1973).

Excretion studies and balance studies were impossible to perform until very recently, when techniques were developed to quantify methadone and its major metabolites in feces. Pharmacokinetic studies have been difficult to perform properly in patients maintained on methadone, since in chronic treatment a reservoir or "pool" of active, available compound is built up and contributes to the plasma concentration of drug to an unknown extent. Thus, tracer techniques must be used, just as they are for pharmacokinetic studies of endogenous substances such as steroid hormones or bile acids. Appropriate ethical constraints limit the amounts of radioisotopes which can be used for study purposes. Since methadone undergoes a rapid and wide distribution in the body with resultant low plasma levels, it is not possible to achieve sufficient radioactivity in plasma to make the needed specific activity measurements, although radioisotopes are useful in measuring the extent of total excretion by the urinary and fecal routes and in identifying the metabolites

72

excreted by each. Thus, the use of stable isotopes is now being explored for studies of methadone disposition. Since mass fragmentography was first introduced by Holmstedt and coworkers in 1968, the usefulness of gas chromatography/mass spectrometry in the identification of drug metabolites has become increasingly obvious (Hammar et al. 1968). These techniques can be used for qualitative and quantitative analyses of drugs and drug metabolites, as well as in tracer studies. Instrumental development has permitted the accurate and precise measurement of increasingly small amounts of compounds in biological fluids; isotope dilutions are now being measured over a wide range. The introduction of chemical ionization/mass spectrometry also has increased sensitivity in the measurements of some compounds for which the electron-impact method does not yield any ions of significant intensity. Two laboratories have now independently synthesized stable isotope labeled methadone, a trideutero- and a pentadeutero-methadone, and have used these compounds in vitro in reverse isotope dilution assays of methadone (Hammar et al. 1968; Sullivan et al. 1975; Anggard et al. 1976; Hachey et al. 1976; Klein et al. 1978; Hachey et al 1977). Using the trideuteromethadone as a tracer in a methadone-maintained patient, plasma disappearance curves could be traced for 16 hours (Anggard et al. 1976). Using the pentadeuteromethadone coupled with balance-study techniques, plasma disappearance curves in maintenance patients can be followed for over 7 days and urine and fecal excretion of methadone and the pyrrolidine metabolite for 14 days (Kreek and Hachey 1975). Using the newly developed techniques, studies are currently in progress to study methadone disposition in a variety of normal and altered physiological states, such as chronic liver disease and in the setting of use or abuse of other drugs or alcohol. Such needed information is not available at this time. Also, studies to compare the disposition of the active l-isomer and inactive d-isomer are being carried out. Using stable isotope techniques, it has recently been shown that the elimination half-life of methadone, as measured in urine of methadone-maintained patients in the steady state, is significantly longer for the active l-isomer (56 hours) than for the inactive d-isomer (34 hours) (Kreek et al. 1977).

In addition to the described studies of methadone disposition in maintenance patients, levels of methadone also have been measured in some other body fluids. Simultaneous measurements of methadone in breast milk and maternal plasma have shown that the breast-milk levels are approximately one-tenth the plasma levels at most time points following an oral dose of methadone (Kreek et al. 1974). A few other studies of methadone levels in breast milk, cord blood, amniotic fluid, and neonatal urine have been carried out and recently reviewed (Gordis and Kreek 1977). However, too few well-designed studies have been carried out to reach important and needed conclusions about methadone disposition in the maternal-fetal unit and in the neonate. More research in this area is needed.

Methadone levels have also been measured in cerebral spinal fluid of maintenance patients undergoing spinal anesthesia (Rubenstein et al. 1978). The cerebral spinal fluid levels of methadone were consistently lower than simultaneously obtained plasma levels. In the future, it will be of great interest to correlate cerebral spinal fluid levels of methadone and appropriate endorphins (Wahlstrom et al. 1976, Terenius et al. 1977). Techniques to measure endorphins in cerebral spinal fluid are now being developed, but precisely which of the several potentially physiologically active endorphins should be measured and how the levels can be interpreted are still topics for future research.

INTERACTIONS BETWEEN METHADONE AND OTHER DRUGS

It is now clear that drugs may interact with each other in a variety of ways. For example, it has been well documented that barbiturate administration can enhance the activity of many microsomal as well as some mitochondrial enzymes, thus altering barbiturate metabolism per se as well as the metabolism of other drugs including the narcotics. Barbiturates may also alter hepatic blood flow, binding and carrier protein levels, and may enhance bile flow. There is conflicting information in the literature concerning the question of whether methadone enhances hepatic microsomal drug-metabolizing enzyme activities, including levels of cytochrome P-450 (or any other cytochrome), and, similarly, whether methadone used on a chronic basis may accelerate its own metabolism by such a mechanism (Angaard et al. 1975; Verebely et al. 1975; Roerig et al. 1976; Takemori 1960; Axelrod 1956; Mannering and Takemori 1959; Alvares and Kappas 1972; Peters 1973; Masten et al. 1975; Spaulding et al. 1976; Datta et al. 1976; Schoenfield and Sadava 1976; Bellward et al. 1977; Peterson et al. 1976a, b). Earlier reports suggested that methadone, morphine, and other narcotics inhibit drug-metabolizing enzyme activities (Takemori 1960; Axelrod

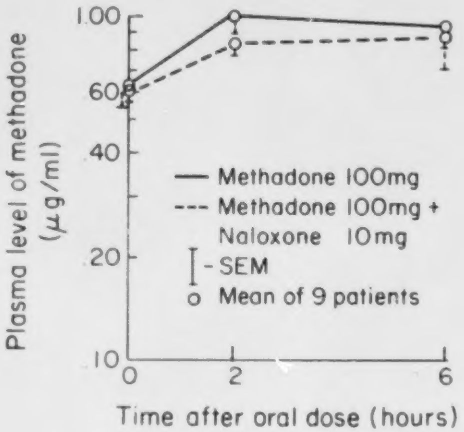
1956; Mannering and Takemori 1959). However, subsequent reports suggested that methadone itself had no effect on cytochrome P-450 or on microsomal drug-metabolizing enzymes which might be involved in its own metabolism (Alvares and Kappas 1972; Peters 1973). Several more recent reports have claimed that methadone can enhance or induce hepatic microsomal drug-metabolizing enzyme activities in some species (Masten et al. 1975; Spaulding et al. 1976; Datta et al. 1976; Schoenfield and Sadava 1976; Bellward et al. 1977; Peterson et al. 1976a,b). Some reports have suggested that such an action also may occur in man, resulting in alterations in methadone metabolism effected by methadone itself during chronic treatment. However, in studies of methadone metabolites in patients on chronic treatment, the rate of biotransformation does not change as reflected by plasma and urine levels of methadone, suggesting that a steady state is readily achieved and sustained even if any initial induction had occurred (Kreek 1973b; Angaard et al. 1975; Verebely et al. 1975). Also, there is no evidence that methadone treatment accelerates the metabolism of any other drug in a way similar to barbiturates, and there is no evidence by morphological examination that methadone treatment increases hepatic smooth endoplasmic reticulum in any species. Thus, there are considerable areas of conflicting data and interpretations of data. It would seem likely that there are species and strain differences in these effects, and perhaps also differences related to sex, to route of administration, and to dose administered (Peterson et al. 1976b). In some studies in which methadone was given both with and without a second agent known to be an inducer of a specific type (e.g., phenobarbital and 3-methylcholanthrene), it has been shown that the addition of either second agent to methadone administration further alters microsomal drug-metabolizing enzyme activities, both qualitatively and quantitatively, suggesting that the mechanism of enzyme induction by methadone, if it indeed exists, is atypical and not yet delineated. Much additional work will be needed to unravel these complexities and then to determine which effects may be seen in humans during chronic treatment.

It has been shown that barbiturate administration both accelerates biotransformation and decreases the duration of methadone analgesia in rats (Alvares and Kappas 1972; Ho and Berndt 1976). Barbiturates also have been shown to increase biliary excretion of metabolites of methadone both by accelerating rate of hepatic biotransformation and by increasing bile flow (Roerig et al. 1975, 1976). Conversely, it has been shown that both the tricyclic antidepressant, desipramine, and the benzodiazepine psychotropic drug, diazepam, inhibit the hepatic metabolism of methadone and alter its disposition in the rat (Liu and Wang 1975; Liu et al. 1976; Spaulding et al. 1974). However, it also has been shown that neither diazepam nor its N-demethylated metabolite, oxazepam, alters the dose response curve for methadone analgesia in the rat, although oxazepam, and not diazepam, was shown to reduce the dose-related stimulation of locomotor activity by methadone (Shannon et al. 1976). The effects of these agents on human subjects receiving methadone or any other narcotic on a chronic basis have not been studied. Both barbiturates and other psychotropic drugs, such as diazepam, are commonly abused by patients, especially during the early phases of methadone-maintenance treatment, and are also commonly used under medical supervision. Thus, an understanding of the effects of such drugs on methadone metabolism, action, and long-term physiological effects are of great interest and importance.

Two different types of drug interactions, both resulting in the same clinical symptoms of narcotic withdrawal, have been observed and studied in methadone-maintenance patients (Kreek 1973b; Kreek et al. 1976, 1978). In one case, a classic narcotic agonist-antagonist interaction was observed when methadone and naloxone were administered orally in a preparation originally designed to prevent any parenteral drug abuse. The small amounts of naloxone in the preparation were expected to be insufficient to produce any withdrawal symptoms when administered orally (Kreek 1973b; Kreek et al. 1976b). However, significant withdrawal symptoms occurred in the majority of patients treated with this preparation (methadone-naloxone ratio 10:1). The patients suffered the acute onset of withdrawal symptoms within 30 minutes after oral ingestion, and the symptoms persisted for 2 to 3 hours and then subsided. They returned with equal intensity after each subsequent dose of the preparation, necessitating its prompt discontinuation. Symptoms included anorexia, nausea, vomiting, abdominal cramps, diarrhea, sweating, irritability, tremulousness, and severe anxiety. Studies of plasma levels of methadone and urinary excretion of methadone and the pyrrolidine metabolite showed that there were no alterations in plasma or urine pyrrolidine metabolite while on the combined preparation as compared with methadone alone (figure 3).

In the second drug interaction, the antituberculosis drug, rifampin, was observed to precipitate signs and symptoms of narcotic withdrawal when added

FIGURE 3.—*Methadone plasma disappearance curves on methadone: naloxone or methadone alone. Reprinted by permission from the* *Annals of the New York Academy of Sciences* *(Kreek, M. J.; Gutjahr, C. L.; Garfield, J. W.; et al. 281:359, 1976).*



to the chemotherapeutic regimen of otherwise well-stabilized methadone-maintenance patients with tuberculosis (Kreek et al 1976a,b). Twenty-one of thirty patients treated with rifampin plus methadone developed withdrawal symptoms; these were severe in 7 cases. Symptoms included nausea, vomiting, anorexia, joint pains, chills, tremulousness, insomnia, and severe anxiety. Six of the severely affected patients were studied to determine if rifampin alters methadone disposition. Gas chromatographic methods were used to measure plasma, urine, and fecal concentrations of methadone and, where possible, the major pyrrolidine metabolite, and chemical ionization/mass spectrometry was used to reconfirm the identification of these compounds. It was shown that concomitant rifampin treatment markedly reduces plasma levels of methadone at all time points after daily oral administration (approximately a 50 percent reduction; $p < 0.01$ (figure 4). At the same time, concomitant rifampin treatment resulted in a marked increase in fecal excretion of the pyrrolidine metabolite and, to a lesser extent, the urinary excretion of the metabolites (table 1 and figure 5). However, plasma disappearance half-times of methadone were not consistently altered by rifampin treatment. The primary mechanism of lowering of plasma levels of methadone, coupled with the apparent reduction in bioavailability (as evidenced by a consistently reduced area under the plasma-level curve of methadone during concomitant rifampin treatment), is probably one of enhancement of microsomal drug-metabolizing enzymes by rifampin. This could result in accelerated biotransformation of methadone to pyrrolidine and subsequent secretion of pyrrolidine into bile during the first pass through the liver. In other studies, using an isolated perfused rabbit-liver preparation, it has been shown that methadone is avidly extracted by the liver (85-90 percent in a single pass over a wide concentration range) (Kreek et al. 1978). Significant amounts of unchanged methadone as well as metabolized methadone are later released from the liver after initial extraction. Thus, it could be postulated that during rifampin treatment, a true "first pass" phenomenon occurs with extraction followed by enhanced metabolism, thus resulting in an actual reduced bioavailability of methadone. Alternatively or additionally, rifampin might increase metabolism of methadone by the intestinal mucosa prior to intial absorption, also increasing a "first pass" effect.

Initial clinical studies of possible dispositional interactions between methadone and ethanol in patients on chronic methadone treatment who are social drinkers have been carried out. Patients without evidence of liver disease or polydrug abuse were studied first while receiving maintenance doses of methadone, then after receiving ethanol 1 hour after the last oral dose of methadone, and finally when ethanol alone was given 24 hours after the last dose of methadone (Kreek 1978b, Cushman et al. 1978). There were no significant differences in plasma levels of methadone when ethanol was given 1 hour after methadone as compared with when methadone was given alone (figure 6). Mean blood ethanol disappearance rates when no methadone had been given for 24 hours (0.23 ± 0.11 μg per 100 ml per min) were similar to the mean rates when methadone was given 1 hour prior to ethanol administration (0.21 ± 0.09 μg per 100 ml per min). Thus, no significant acute interaction between ethanol and methadone, as reflected by the blood disposition of each, was observed.

Large percentages of both heroin addicts and methadone-maintenance patients use alcohol to excess on a chronic basis (Kreek et al. 1972, Kreek 1973a; Brown et al. 1973, Bihari 1974; Maddux and Elliott 1975). Many more use alcohol on a social basis. Alcohol abuse has become the major medical and behavior problem in methadone-maintenance patients during treatment and following detoxification. Alcohol-related problems are the leading medical causes of death in these groups. Studies are needed

FIGURE 4.–*Methadone plasma disappearance curves off and on concomitant rifampin treatment. Reprinted by permission from the New England Journal of Medicine (Kreek, M. J.; Garfield, J. W.; Gutjahr, C. L.; et al. 294:1105, 1976).*

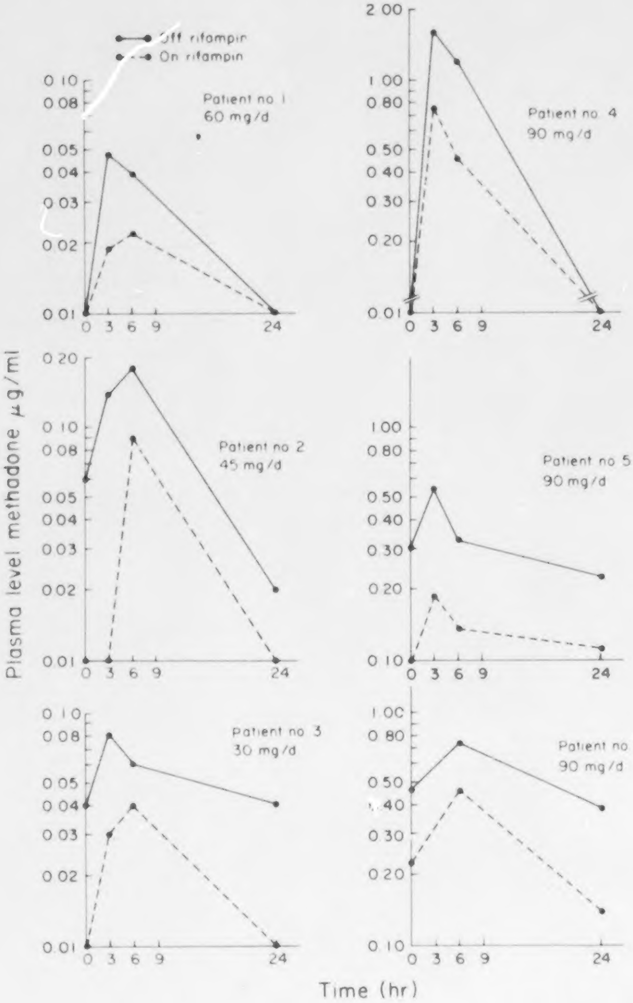


FIGURE 5.—*Urinary excretion of methadone and pyrrolidine metabolite off and on rifampin treatment. Reprinted by permission from the* *Annals of the New York Academy of Sciences* *(Kreek, M. J.; Gutjahr, C. L.; Garfield, J. W.; et al. 281:365, 1976).*

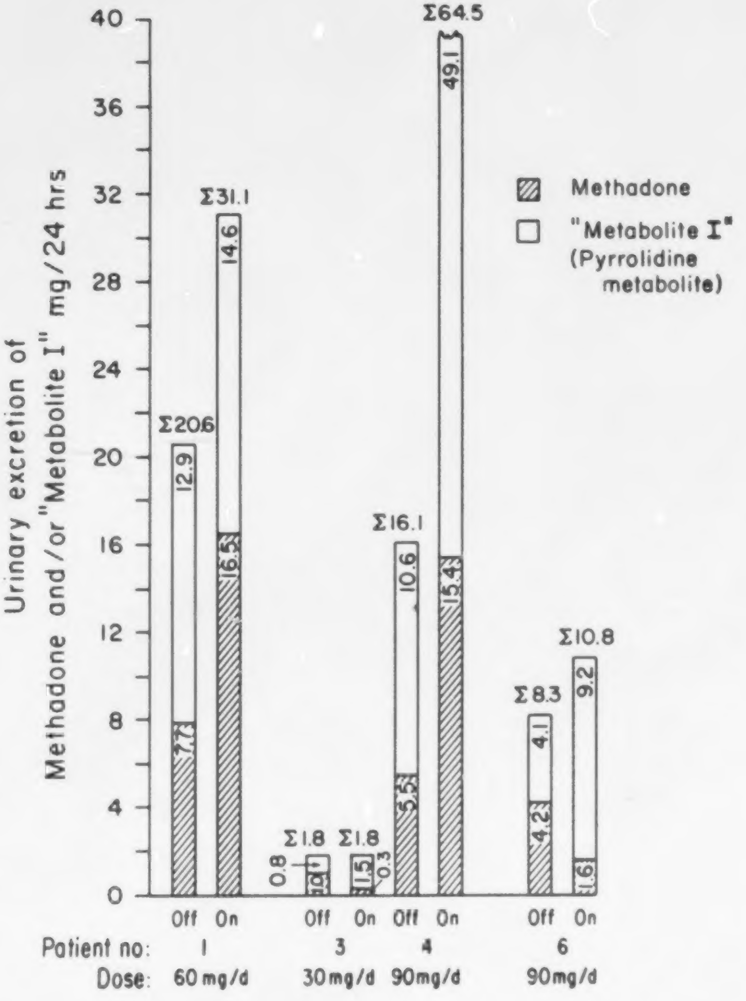


TABLE 1.–*Fecal excretion of methadone and pyrrolidine metabolite off and on rifampin treatment*

Patient and methadone dose	Rifampin	Fecal Excretion in 24 hours (mg)		
		Methadone	Pyrrolidine	Sum
no. 1	Off	.13	7.6	7.73
(60 mg/d)	On	.41	31.8	32.21
no. 2	Off	.63	10.2	10.83
(30 mg/d)	On	.44	26.5	26.94

Reprinted from Kreek et al. in Critical Concerns in the Field of Drug Abuse, by courtesy of Marcel Dekker, Inc.

to evaluate the possible effects of ethanol on methadone metabolism, and conversely, the possible effects of methadone on ethanol metabolism. Also, since disulfiram is the agent most commonly used in the management of abstinent alcoholic methadone-maintenance patients, and since it has been reported that disulfiram may impair the metabolism of many drugs, in addition to its effect on ethanol and acetaldehyde metabolism, the possible interactions of methadone and disulfiram also should be studied (Pugliese et al. 1975; Charuvastra et al. 1976; Vesell et al. 1971).

Possible interactions between methadone and the anticonvulsant, phenytoin (Dilantin), have been suspected on a clinical, as well as postulated on a theoretical, basis (Finelli 1976). However, to date no formal studies of such a potential interaction have been reported.

COMMON MEDICAL COMPLICATIONS IN METHADONE-MAINTENANCE PATIENTS

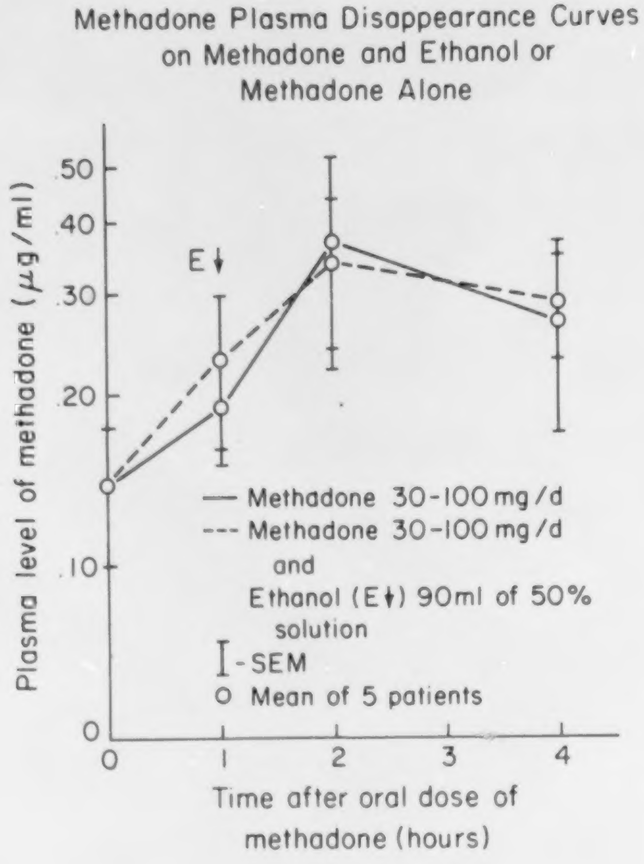
The most common medical complications observed in patients receiving methadone maintenance are primarily related to preexisting chronic diseases acquired during the years of street use of narcotics and other drugs, to a wide variety of clinical problems which are the same as those in the general population of patients with similar social, economic, and living circumstances, or to problems related to polydrug or alcohol abuse. Medical problems of narcotic addicts and of methadone-maintenance patients have been extensively reviewed (Kreek 1972; 1973a, Kreek et al. 1972a; Kreek 1978b; Finelli 1976; Louria et al. 1967; Cherubin 1967; Sapira 1968; Sapira et al. 1968). The most frequently encountered chronic diseases in patients at time of admission to methadone treatment include chronic liver disease, chronic renal disease, tuberculosis, and venereal disease. Each of these diseases may alter both the physiological effects and disposition of methadone and on a chronic basis. However, for the most part, the specific effects of each of these conditions on each pharmacological or physiological effect have not been delineated.

In both a prospective and a retrospective study of heroin addicts at time of admission to methadone treatment, two-thirds showed clinical and/or biochemical evidence of chronic liver disease and the abnormalities persisted during 3 or more years of chronic treatment, during which time there was minimal or no parenteral drug abuse (Kreek 1972, 1973a; Kreek et al. 1972).

After 3 or more years of methadone treatment, 12 percent of patients studied prospectively were found to be carriers of the hepatitis B antigen (HB$_s$Ag), and 46 percent had hepatitis B antibody (Hb$_s$Ab) (by the most sensitive available methods) (Kreek et al. 1972). Thus, posthepatitic liver disease (chronic persistent hepatitis, chronic aggressive hepatitis, or postnecrotic cirrhosis) was probably the most common lesion. However, in the prospective study, 20 percent of patients were abusers of alcohol at time of admission to treatment and 25 percent were alcohol abusers after 3 or more years of treatment; thus, alcoholic or mixed-type liver disease was probably present in some patients (Kreek et al. 1972). In the prospective study in which each patient served as his own control in data analysis, it was shown that the progression of liver disease occurred primarily in alcohol abusers. It was also shown that those patients with normal liver function at time of admission remained normal during treatment. There was no evidence of methadone hepatotoxicity.

Over 50 percent of the heroin addicts studied had serum protein abnormalities at time of admission to treatment and during chronic maintenance treatment. Levels of all fractions of globulins including alpha$_1$, alpha$_2$, beta, and gamma globulin were elevated (Kreek 1972, 1973a; Kreek et al. 1972).

FIGURE 6.–*Plasma levels of methadone in five stabilized maintenance patients (not alcohol abusers) after oral dose (30 to 100 mg) alone and after oral dose followed in 1 hour by 90 ml of a 50 percent solution of ethanol; determinations by gas/liquid chromatography. Adapted from Cushman et al. Drug and Alcohol Dependence, 3:35-42, 1978. Reprinted from Kreek in Factors Affecting the Action of Narcotics, edited by Adler, Manara, and Samanin, p. 730. Copyright © 1978. Reprinted by permission of the publisher, Raven Press, New York.*



Of interest, in a population with a high prevalence of malnutrition and chronic liver disease, albumin levels were normal or even elevated in the majority of patients, and these findings persisted during treatment. These observations now have been extended by animal studies in which stimulation of albumin synthesis during chronic treatment with methadone has been observed (Rothschild et al. 1976). Over 75 percent of patients studied after 3 or more years of treatment with no continued parenteral drug abuse had elevated levels of IgM, and 50 percent had elevated levels of IgG (Kreek 1972, 1973a; Kreek et al. 1972).

SIDE EFFECTS AND ADVERSE REACTIONS DURING CHRONIC METHADONE-MAINTENANCE TREATMENT

Several types of side effects have been reported in patients undergoing methadone-maintenance treatment. Some of these are probably due to the pharmacological and physiological effects of the drug itself, while others may be due to preexistent or unrelated medical complications. Since tolerance develops at different rates to the different specific acute narcotic effects, as described above, many so-called "side effects of methadone" observed during the early weeks or months of maintenance treatment are in fact simply well-established narcotic effects, which persist until tolerance to the methadone dose used is reached. Such side effects become especially prominent if the dose of methadone is raised too rapidly in the early weeks of treatment. Thus, undesired narcotic effects such as euphoria, drowsiness, and somnolence may be observed in maintenance patients if the dose is raised at a rate exceeding the development of tolerance (table 2). In two separate studies, the first of patients in chronic methadone treatment for 6 months or more, and a second prospective study of patients reevaluated after 3 or more years of chronic maintenance treatment, the following symptoms were reported: increased sweating, constipation (which became less prevalent with increasing time in treatment), abnormalities in sexual function and libido, sleep abnormalities, and altered appetite (table 3). In the study of patients in treatment for about 6 months, some additional signs and symptoms were observed, which might have been due to an insufficient degree of tolerance for the dose given or to administration of an insufficient dose of methadone.

To date, there is no physiological explanation for the high prevalence of increased sweating in maintenance patients. There have been no medical complications reported related to excessive perspiration, even in patients working as manual laborers performing physically strenuous tasks while exposed to heat.

Chronic constipation is probably due to persistence of the acute narcotic effects on small and large intestine, that is, poor motility due to inadequate propulsive contractions leading to stasis of fecal material with excess reabsorption of water. Hypomotility during the early months of maintenance treatment has been documented by radiographic techniques (Kreek 1973a). Further studies of motility of all parts of the gastrointestinal tract in patients on chronic treatment would be of interest. Development of tolerance to the narcotic effects of morphine on intestinal transit in dogs has been documented (Burks et al. 1976). In man, tolerance seems to develop slowly to this particular narcotic effect, and in some patients it fails to develop to any significant degree. Chronic constipation leading to severe fecal impaction and acute intestinal obstruction has been observed and successfully managed in several cases (Spira et al. 1975). There is one reported case of a methadone patient who died from this type of intestinal obstruction secondary to fecal impaction because he did not seek medical help (Rubenstein and Wolff 1976). This is the one documented case of a methadone-maintenance patient dying of a problem directly related to methadone treatment.

Since the small intestine of several species has been documented to contain specific opiate receptors, and since the intestine has been the one organ other than the brain well known for years to have highly specific responses to opiate administration, it will be of interest in the future to learn if normal intestinal motility is under at least partial control of a local or circulatory endorphin system. A provocative recent report suggested that the two pentapeptide endorphins, leucine- and methionine-enkephalin caused hypomotility similar to that caused by morphine after intraventricular injection in mice (Cowan et al. 1976).

TABLE 2.—*Side effects observed in patients during first 6 months of methadone-maintenance treatment**

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1. Primary narcotic effects: euphoria ("high"), drowsiness, somnolence ("nodding")
2. Constipation
3. Excessive sweating
4. Insomnia—often accompanied by nightmares while sleeping
5. Interference with sexual function
6. Menstrual irregularities
7. Difficulty in urination—transient
8. Edema of lower extremities—transient
9. Joint pains and swelling—transient
10. Skin rash—transient
11. Upper gastrointestinal symptoms (pain, nausea, vomiting)
12. Bradycardia and hypotension

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*Incidence not quantitated; occurrence not related to dose or rapidity of ascending to that dose; transient—occurrence in first few days lasting very brief period only.

Adapted from Dobbs, W. H. JAMA, 218:1536-1541, 1971.

TABLE 3.–*Side effects observed in patients during chronic methadone maintenance treatment*

1. Intermediate length treatment (6 months or more; < 40– > 80 mg/d)* Percent	Symptoms and signs	2. Long-term high-dose treatment (3 years or more; 80-120 mg/d)** Percent
47	Increased sweating	48
57	Constipation	17
	(Initial laxative use, average 8 months)	(59)
26	Libido abnormalities	22
—	Orgasm abnormalities	14
23	Sleep abnormalities (insomnia)	16
19	Appetite abnormalities	4
25	Nausea	—
23	Drowsiness	—
21	Nervousness-tenseness	—
12	Headaches	—
11	Body aches and pains	—
10	Chills	—
(?)	Weight gain	(?)

*Adapted from Yaffe, G. J., Strelinger, R. W., Parwatikar, S. Proceedings of the Fifth National Conference on Methadone Treatment. Volume 1, pp. 507-514. 1973.

**Adapted from Kreek, M. J. JAMA, 223:665-668, 1973.

Abnormalities of sexual function and libido are more difficult to relate to a specific physiological effect of methadone treatment, since such problems are common in the general population and no adequate studies have been carried out to determine the prevalence of such complaints and documented problems in contrast subjects of similar age, sex, ethnicity, social, economic, and living conditions. Complaints of sexual dysfunction such as decreased libido, inability to achieve or sustain an erection, or premature ejaculation often come from maintenance patients who are known to have had children while in treatment. Conversely, some patients in maintenance treatment with documented abnormalities of biochemical tests reflecting reproductive endocrine function, such as a lowered serum testosterone level, have no clinical complaints of sexual dysfunction or decreases in libido. Sexual dysfunction may result from depression, fear of parenthood, and from use of a wide variety of drugs of different types (Editorial 1977). Observed biochemical abnormalities and possible physiological effects of methadone treatment on sexual function and reproductive endocrinology are discussed in detail below.

Sleep abnormalities, especially insomnia, are reported by some patients in long-term methadone-maintenance treatment. Conversely, somnolence, an acute narcotic effect, is common during the first few weeks of methadone treatment before tolerance is gained to this primary narcotic effect. Prospective electroencephalographic and sleep studies have been performed in methadone-maintenance patients. It has been shown that during the early weeks of methadone treatment, EEG tracings of patients maintained on methadone have increased alpha abundance, slowing of alpha frequency, and theta and delta bursts. After 2 to 3 months of maintenance treatment, tolerance develops and EEG tracings return to pretreatment patterns (Fink et al. 1971). It also has been reported that during early methadone treatment there is a decrease in REM and stages 3 and 4 sleep, but that during chronic treatment tolerance is developed and normal REM and stages 3 and 4 sleep return in most patients (Henderson et al. 1970). However, in some patients an increase in number of awakenings persists, although to a lesser extent.

Appetite abnormalities, especially mild anorexia, are primarily seen within the first 6 months of treatment, along with nausea and drowsiness, which are probably residual acute narcotic effects (table 3). Conversely, nervousness, headaches, body aches, and pains also observed during early months of treatment are more likely mild symptoms of early abstinence, occurring when the daily dose of methadone given for some reason is not adequate to prevent all withdrawal symptoms for 24 hours.

Although not well documented in any prospective study, weight gain during methadone-maintenance treatment is a very common finding among patients during both early and long-term methadone maintenance. In many patients, the weight gain is simply a desired return to a normal weight, but in others excessive weight gain becomes a medical problem. The factors contributing to this weight gain have not been defined clearly. Certainly, the street-heroin addict has a very atypical lifestyle, with constant physical activity involved in the acquisition of money for subsequent purchase of heroin, coupled with very poor eating habits. The patient who has entered successfully into methadone treatment has a much more stable, often sedentary, lifestyle and has time, money, and encouragement to eat regularly. Weight gain may be due in part to these social factors, yet undelineated physiological effects of the drug itself also might be operative. A few studies of glucose metabolism in patients at time of admission to and prospectively during methadone treatment have been carried out, both using the oral glucose tolerance test and simply fasting and 2-hour postprandial blood sugar (Kreek 1972; Kreek et al. 1972). No evidence of hyperglycemia or of hypoglycemia has been present in these studies, despite some earlier reports that narcotics, at least on acute dosage, can cause hyperglycemia. However, further studies on glucose metabolism, especially in the group of patients experiencing significant weight gain during methadone treatment, are needed. Also, since clinical and experimental studies suggest that albumin synthesis may be enhanced in man as well as in animals during chronic treatment with methadone, the possible contribution of increased protein synthesis or related water retention due to increased total albumin content to observed weight gain should be studied. When central nervous system control of appetite becomes more clearly defined in man, studies of possible relationships between this control mechanism and the endorphin-receptor systems will be of interest.

The observation of weight gain in patients during methadone treatment may or may not be related to recently reported observations from a carefully designed study of birth weights of babies born to heroin addicts, addicts using both heroin and illicit methadone, drug-free former heroin addicts, and former addicts well maintained on methadone. In this study it was observed that the babies born of methadone-maintained mothers were of significantly higher birth weight than the babies in the other three groups (Kandall et al. 1976).

All of these clinical observations in man are at variance with many studies carried out in animals which have suggested that methadone may retard weight gain or growth in adult, neonatal, and fetal animals. Unfortunately, many of these studies have been carried out using doses of methadone far beyond those which would give sustained significant narcotic effects; near-overdose-type toxicity thus is often studied, making the findings difficult to interpret.

In both prospective and retrospective studies of the medical status of patients on chronic methadone treatment, there has been no evidence of toxicity of methadone for any organ system (Kreek 1976a). In a prospective study in which patients were followed from time of admission until after 3 or more years of chronic methadone treatment, with each patient serving as his own control, significant changes of values were found for three tests only: polymorphonuclear leukocytes on differential count, which fell from elevated to normal levels; lymphocytes on differential count, which became increasingly elevated; and blood urea nitrogen levels, which fell from elevated to normal levels (Kreek 1973a). Two of these three changes represent a return to normalcy. The rise in lymphocyte count remains unexplained, although large percentages of patients had abnormal liver function or serum protein test values, or both, at time of admission, and these abnormalities persisted without significant change during 3 or more years of methadone-maintenance treatment (Kreek et al. 1972; Kreek 1973a). The only subgroup of patients in whom deterioration of liver function occurred during chronic treatment was those known to be abusing alcohol on a chronic basis.

Deaths due to methadone overdose itself have not occurred in methadone-maintained patients stabilized on usual clinic doses. However, it must be emphasized that methadone in maintenance-treatment doses, when accidentally or purposefully taken by a nontolerant or partially tolerant individual, will cause a potentially lethal overdose syndrome within 30 minutes to 6 hours. If such an overdose is discovered while the person is still alive, it can be effectively reversed by prompt and proper treatment including establishing an airway, sustaining respiration, establishing an intravenous line, and administering the specific narcotic antagonist, naloxone, intravenously (Dole et al. 1971; Gay and Inaba 1976). Since naloxone has only a 2- to 3-hour duration of action, while methadone has a 24- to 72-hour duration of action in naive subjects, naloxone must be readministered every 2 to 3 hours as needed, and the patient must be kept under close observation in the hospital for up to 72 hours.

PHYSIOLOGICAL AND BIOCHEMICAL EFFECTS OBSERVED DURING CHRONIC METHADONE TREATMENT IN MAN

Many intriguing observations have been made of various physiological and biochemical effects in methadone-maintained patients which are probably due to methadone itself, yet which cannot be related to any specific clinical condition, illness, or alteration in normal body function. Nevertheless, these observations are of potential importance and need to be investigated further, both in clinical studies and in appropriate animal models and in vitro preparations, since they may have implications for long-term treatment and may provide clues as to the mechanisms controlling or modifying the development and maintenance of tolerance to and dependence upon narcotic drugs and to the addictive process itself.

Some of the clinical observations which have been made of possible physiological effects of methadone are difficult to interpret, since the contributions of underlying chronic diseases, especially liver disease, and of ongoing polydrug and/or alcohol abuse have not been considered or defined. Also, many of the effects which have been reported are seen only during early phases of methadone treatment and are due to the incomplete development of tolerance to specific acute narcotic effects.

During the first 12 months, a variety of observations concerning abnormalities reflecting endocrine function and control of respiration have been made, usually without direct correlation in a given individual to any clinical complaint or finding (table 4). Diverse studies of endocrine function have been carried out in patients maintained on methadone. It has been suggested that very early in treatment, before tolerance develops, inappropriate secretion of antidiuretic hormone may occur, accounting for clinical signs of decreased urine output and generalized edema in a small number of patients. Levels of urinary 17 hydroxy- and 17 keto steroids and morning and evening levels of plasma cortisol have been found to be normal even during the early months of treatment. Provocative ACTH infusion, dexamethasone suppression, and metapirone tests have been performed in former heroin addicts in a drug-free state and then repeated sequentially in these patients during early phases of methadone treatment and stabilization (Kreek 1972; Kreek 1973a; Cushman and Kreek 1974). All of these tests were normal except for the metapirone test. This test of hypothalamic reserve was abnormal, as evidenced by an inability to release additional amounts of ACTH under chemical blockade of cortisol production, in patients during the first 2 months of methadone treatment when ascending doses of methadone were given. When these tests were repeated after the patients were stabilized on methadone, the results were normal. In studies of plasma cortisol response to cold exposure in methadone-maintenance patients, it was shown that there was no difference in the cortisol response between methadone-treated and control subjects when the test was carried out 1 hour after methadone. However, an exaggerated response was observed in maintained patients when studied at 21 hours after the last dose of methadone, suggesting that, at the end of a full duration of action of a dose of methadone, there is an increased responsiveness to the stress of cold exposure (Renault et al. 1972). Resting levels of growth hormone, insulin, glucose, and free fatty acids have been found to be normal in patients stabilized on methadone-maintenance treatment (Cushman 1972).

TABLE 4.–*Endocrine and respiratory control abnormalities observed during first 12 months of methadone treatment*

1. Indirect evidence of release of antidiuretic hormone.
2. Abnormal metapirone test of hypothalamic reserve
   (hypothalamic-pituitary-adrenocortical axis).
3. Abnormal plasma cortical response to stress (cold exposure)
   (hypothalamic-pituitary-adrenocortical axis).
4. Decreased FSH levels
   (hypothalamic-pituitary-gonadal axis).
5. Decreased LH levels
   (hypothalamic-pituitary-gonadal axis).
6. Abnormal positive feedback control by estrogen of LH release
   (hypothalamic-pituitary-gonadal axis).
7. Decreased sensitivity of CNS receptors to CO_2.
8. Alveolar hypoventilation.
9. Arterial hypercapnia.

Lowered levels of the gonadotropic hormones, FSH and LH, have been reported (table 4) in patients during the first year of methadone treatment (Martin et al. 1973). In patients who have been stabilized on methadone treatment for 1 year or more, FSH and LH levels and release patterns of these hormones have been found to be normal (Cushman and Kreek 1974a,b). Secondary amenorrhea or very irregular menses are present in up to 90 percent of female street-heroin addicts and disappear in most patients during the first year of methadone treatment. With the return of normal menstruation cycling in premenopausal patients, fertility appears to be restored or enhanced in many patients (Kreek 1972, 1973a; Santen 1974; Santen et al. 1975; Blinick 1968). The biochemical indices of female reproductive endocrine function which are abnormal during the first few months of methadone treatment, especially positive feedback control of LH release by estrogen, become normal as tolerance is developed during longer durations of treatment (Santen et al. 1975).

Control of respiration has been studied in some patients during the early months of methadone treatment and several abnormalities have been demonstrated, although no associated clinical findings are described (Marks and Goldring 1973; Santiago et al. 1977). These abnormalities include decreased sensitivity of CNS receptors to CO_2, alveolar hypoventilation, arterial hypercapnia, and a decreased sensitivity of CNS receptors to hypoxia.

More persistent physiological or biochemical effects observed during chronic methadone-maintenance treatment have been reported, including chronic effects on endocrine and respiratory function and serum protein and immunological abnormalities (tables 5 and 6).

Decreased serum testosterone levels have been reported in 15-55 percent of male methadone-maintenance patients studied, and in some of these studies the patients have been in treatment for more than 1 year (table 5). Unfortunately, in most of the reported studies, there is no subclassification of patients studied according to the presence of chronic liver disease (50-75 percent of all maintenance patients), chronic abuse of alcohol (20-50 percent of all maintenance patients), and marihuana and polydrug abuse, four factors which significantly alter serum testosterone levels as well as other indices of reproductive endocrinology and function (Cushman and Kreek 1974a; Cushman 1973a; Azizi et al. 1973; Mendelson et al. 1975a,b; Cicero et al. 1975). Also, "control" groups have often been inappropriately selected and usually are not properly matched for age, ethnicity, social and economic status, health and nutritional status, and living conditions. There is a suggestion in several studies that there is a higher incidence of abnormally low levels of testosterone in patients receiving more than 60 mg/d of methadone (Cushman and Kreek 1974a,b; Cushman 1973a; Mendelson 1975a). In one study correlating serum testosterone levels with plasma levels of methadone, there was some suggestion of but no significant reciprocal correlation between the two, with a greater number of low testosterone levels associated with higher plasma levels of methadone (figure 7). Levels of testosterone which were lower than the normal levels established for the study (less than 300 μg per ml) were observed in 6 of 43 determinations, but plasma levels of methadone varied widely. Although it has been

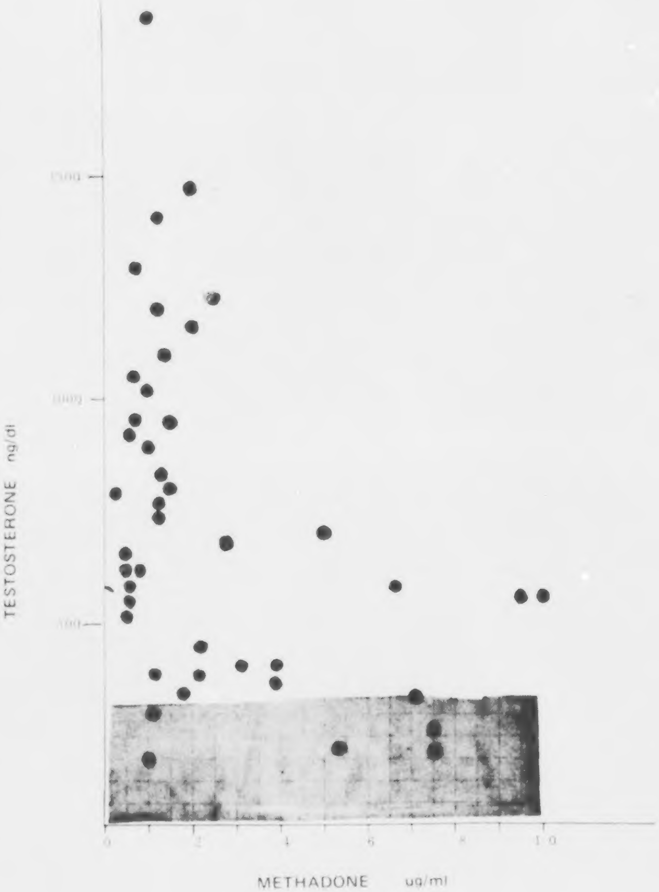
TABLE 5.—*Endocrine and respiratory control abnormalities observed during chronic methadone treatment (12 months or longer in treatment)*

1. Decreased testosterone levels.
2. Decreased seminal-fluid volume.
3. Decreased sperm motility.
4. Increased or decreased prolactin levels.
5. Altered dirunal variation of prolactin levels.
6. Increased thyroxine-binding globulin.
7. Increased thyroxine levels.
8. Increased triiodothyronine levels.
9. Decreased sensitivity of CNS receptors to hypoxia.

TABLE 6.—*Serum protein and immunological abnormalities observed during chronic methadone treatment*

	Percent of patients studied with abnormalities
1. Increased total serum protein	>30
2. Increased serum albumin	>20
3. Increased serum globulins	>30
4. Increased serum IgM	35-70
5. Increased serum IgG	30-50
6. Lymphocytosis	>20
7. Abnormal percent of B cell- and T cell-rosette formation in vitro	—
8. Biological false positive test for syphilis	>10
9. Increased thyroxine-binding globulin	>50

FIGURE 7.—*Relationship between plasma, testosterone, and methadone levels in eight patients determined in samples collected between 11 a.m. and 3 p.m.; the shaded area constitutes values considered to be abnormally low. From Cushman and Kreek in Narcotics and the Hypothalamus, edited by Zimmerman and George, p. 169. Copyright © 1974. Reprinted by permission of the publisher, Raven Press, New York.*



postulated that methadone may reduce testosterone levels by impairing release of the tropic hormone, LH. In this study, LH levels were normal in all patients studied, including those with low levels of serum testosterone. In other studies, it has been shown that acute heroin use reduced gonadotropin secretion, and that both acute and chronic heroin use caused reduced levels in plasma testosterone (Mendelson et al. 1975a, Mendelson and Mello 1975, Mirin et al. 1976). However, heroin is a short-acting narcotic and thus as used in the street or in these studies it has characteristically high peak levels of availability and action followed by a steep decline in both. In contrast, methadone has both sustained effects and plasma levels over 24 hours when used on a chronic basis and has low peak plasma levels and peak action. Therefore, effects of heroin, even when used on a chronic basis, on both central gonadotropin release and peripheral gonadal function could be quite different from that of chronic methadone usage. In one study, both decreased seminal fluid volume with resultant increased sperm count and decreased sperm motility were found in a small group of methadone-maintained patients, but both alcohol and marihuana abuse may have been present in the study subjects selected (Cicero et al. 1975). Abnormal findings have been reported in a study of effects of methadone on reproductive organs in rats, but exceedingly large doses of methadone were used (Cicero et al. 1976). Better designed, more carefully executed clinical studies are required with proper selection and classification of patients, exclusion of patients abusing other drugs or alcohol, and appropriate control subjects, along with better laboratory studies using appropriate, nonexcessive doses of narcotics. Information from such studies not only is essential for good medical care and treatment planning, but also may provide some insight into mechanisms of feedback control and function of endorphins as related to reproductive physiology.

Recently, an intriguing new clinical observation has been made concerning possible lack of development of tolerance to a specific narcotic effect on neuroendocrine function. It has been shown that acute morphine administration in the rat will cause a release of prolactin, and it has been postulated that the primary effect is one of inhibition of the prolactin-inhibitory factor in the hypothalamus (Zimmerman and Pang 1976). This effect may parallel another acute effect of morphine which results in a decrease of LH release, which is postulated to be due to an inhibition of the LH-releasing hormone in the hypothalamus. In one study of prolactin levels in long-term methadone-maintenance patients, studied in an outpatient setting, prolactin levels all were within normal levels, as were FSH and LH levels (Cushman and Kreek 1974b). In a more recent outpatient study of a larger number of methadone-maintained patients, whose blood samples were obtained at random times following an oral dose of methadone, 44 percent of the prolactin levels determined were elevated slightly above normal.[1] However, random bursts of prolactin release can be detected, especially in the setting of stress of any type, in normal subjects. Patients on long-term methadone-maintenance treatment are being studied on an inpatient basis in a clinical research center facility, where dose of methadone, time of administration of dose, time of food intake and sleep, and time of blood sampling for studies of methadone disposition and reproductive endocrine function all can be highly controlled and blood specimens obtained from an indwelling cannula.[2] Also, in these studies the presence or absence of liver disease and the use or abuse of other drugs or alcohol can be carefully determined. Preliminary results available from 15 patient studies have shown that FSH and LH levels were normal at all time points studied following an oral dose of methadone and that the normal diurnal variation was preserved, with highest levels present in the morning and a gradual decline during the day. However, although mean prolactin levels were normal, a distorted diurnal variation was observed, with peak prolactin levels at midday, and lower levels in both the morning and the early evening. The peak levels of prolactin were observed at a time concomitant with the determined peak mean plasma levels of methadone; both occurred 4 hours after the oral dose of methadone. This finding suggests that, although no clinical abnormalities related to atypical prolactin release could be detected and although all other measured indices of neuroendocrine and peripheral endocrine function were normal in the patients, who had been in steady state methadone treatment for more than 1 year, prolactin release appeared to be still responsive to the modest increase in plasma levels of methadone; this may be due to a specific persistent narcotic effect on the central nervous system. Since, in fact, prolactin inhibitory factor may be dopamine, it is intriguing to speculate that these observations may indicate a persistent inhibitory effect of methadone on dopamine receptors. Further studies of the observed phenomenon should be performed, along with consideration of the possible relationships to endorphin release and to the maintenance of tolerance and dependence.

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[1] Unpublished observations of the author, B. Saxena, and E. Khun.

[2] Unpublished observations of the author and B. Saxena.

Many clinical studies on possible physiological effects of chronic methadone treatment on thyroid function have been carried out (Cushman and Kreek 1974a, Shenkman et al. 1972; Webster et al. 1973; Azizi et al. 1974; Bastomsky and Dent 1976). However, although increased levels of both thyroxine (T_4) and triiodothyronine (T_3) have been observed in some otherwise euthyroid patients, other indices of thyroid function have been normal with one exception; increased levels of thyroxine-binding globulin have been observed in most methadone-maintenance patients studied. The observed elevated levels of thyroxine and triiodothyronine are probably related to the observed elevations of levels of thyroxine-binding globulin in the patients. The elevated levels of thyroxine-binding globulin are probably nonspecific (or at least to date unexplained) and related to the observed elevations in levels of many other serum proteins in methadone-treated patients.

In some animal studies, it has been suggested that some direct relationship between narcotics and adenylate cyclase-cyclic AMP system may exist. Using a neuroblastoma-glioma hybrid cell culture system in vitro, it has recently been shown that the endogenous opiates, met- and leu-enkephalin, as well as morphine and related exogenous narcotics, inhibit adenylate cyclase activity of neurons with opiate receptors and possibly thus suppress the action of other neurohormones or transmitters which usually activate adenylate cyclase (Klee et al. 1976). However, narcotics and possibly endorphins also cause a delayed increase in the specific activity of adenylate cyclase during chronic exposure of cells, which then overcomes the acute inhibitory action of the narcotics. It has been suggested that humans receiving narcotics on a chronic basis, and therefore tolerant to narcotics, would have normal levels of 3'5' adenosine monophosphate (cyclic AMP), the synthesis of which is catalyzed by adenylate cyclase, but that during withdrawal from narcotics, increased levels of cyclic AMP would be observed (De Leon-Jones et al. 1977). In a recent study of chronic methadone-maintenance subjects, 24-hour urinary excretion of cyclic AMP was normal; also, however, cyclic AMP levels were not affected by either gradual or acute withdrawal of methadone, but remained normal (De Leon-Jones et al. 1977). Thus, only part of the earlier hypothesis could be supported by this reported study.

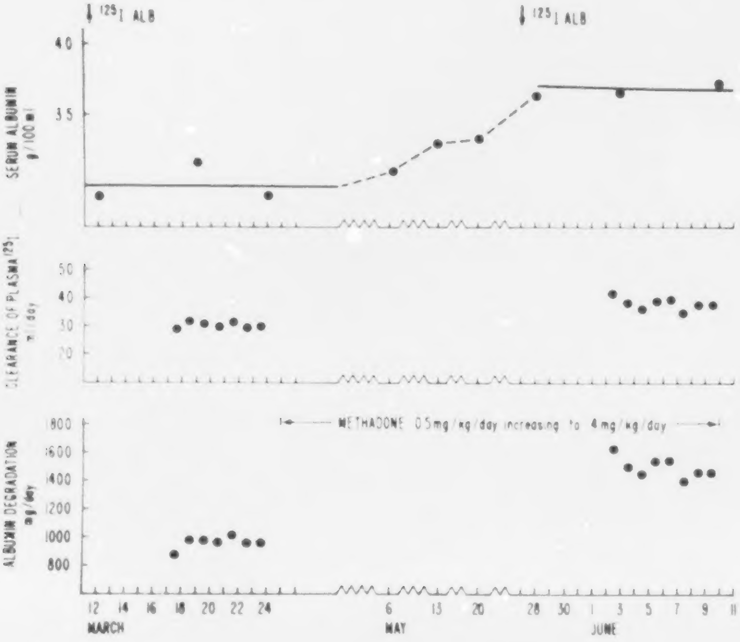
Once they become feasible, extensive clinical studies are needed of the possible physiological effects of chronic methadone treatment on the new neuroendocrine hormones, the endorphins, as mentioned above. Many of the endorphins which have been characterized to date are derived from or have identity to various peptide lengths from β-lipotropin, which contain also β-MSH and share an identical peptide length with ACTH (Goldstein 1976; Marx 1976; Goldstein and Cox 1977). Such studies ideally would relate exogenous narcotic and endorphin disposition with observed physiological effects.

Only one chronic physiological effect of methadone on respiratory function has been documented (Santiago et al. 1977). Although during the first several months of treatment multiple indices of pulmonary function may be altered, as described above, it has been shown that all indices return to normal after 8 months or more of chronic steady-state treatment, with the exception of a persistent reduction in sensitivity of central nervous system receptors to hypoxia (table 5) (Santiago et al. 1977).

Many diverse abnormalities in serum proteins and immunological indices have been observed in patients, both at time of admission to and during chronic methadone treatment (table 6) (Kreek 1972, 1973a; Kreek et al. 1972; Cushman 1973b,c; Cushman and Grieco 1973; Drusin 1974; Cushman and Sherman 1974; Sherwood et al. 1972; Geller and Stimmel 1973; Cushman et al. 1977). Elevated levels of total serum proteins, and serum albumin and total globulins, as well as elevated serum levels of α_2 and β-globulins, thyroxine-binding globulin, and the immunoglobulins IgM and IgG, have been observed in large percentages of patients before and during methadone treatment. Biological false positive tests [illegible] syphilis also are frequently seen; these can be positively correlated with persistent elevations in IgM levels (Kreek 1972, 1973a; Kreek et al. 1972; Drusin et al. 1974; Cushman and Sherman 1974). Relative lymphocytosis is observed in many patients at time of admission to methadone treatment and apparently increases in prevalence during chronic treatment (Kreek 1973a). In a recently reported in vitro study of cells from methadone-maintained patients, B cell and T cell rosette formation occurred in abnormal percentages as compared with rosette formation with cells from control subjects (Cushman et al. 1977).

Many or most of these serum protein and immunological abnormalities observed may be due in part to chronic liver disease or to changes effected by the years of regular injections of unknown mixtures of foreign substances along with heroin, prior to entry into methadone treatment. However, possible direct narcotic effects on protein metabolism or immunological function need to be studied further, especially in light of one very intriguing recent laboratory study supporting an earlier clinical observation. In both the prospective and retrospective studies of patients at time of admission to and during methadone treatment, normal levels of serum albumin were observed in the majority and elevated levels of serum albumin in some patients, and the percentages of patients with elevated levels of albumin increased with time in chronic methadone treatment. Serum albumin levels are characteristically lowered in patients with chronic liver disease, other chronic infectious diseases, and with poor nutritional status; also, serum albumin levels are usually reciprocally lowered when globulin levels become elevated due to any cause. Thus, the finding of elevated levels of total albumin and globulin fractions in this patient population was unanticipated and without precedent. The possibility that the long-acting narcotic, methadone, might alter albumin metabolism and disposition was therefore explored in a study using a rabbit model. Studies of albumin metabolism and distribution were carried out before and after chronic treatment with methadone (figure 8) (Rothschild et al. 1976). Several alterations in albumin disposition were observed. These included increases in total exchangeable albumin space, total serum protein and serum albumin levels, and total extravascular albumin, coupled with an increased rate of albumin degradation, all indicating that chronic methadone treatment in rabbits effected a sustained increase in

FIGURE 8.—*An example of the effects of chronic methadone treatment on albumin metabolism in the rabbit (Rabbit No. 5); the serum albumin rose from 3.2 to an average of 3.8 g per 100 ml; the product of the serum albumin level and the slightly elevated renal clearance resulted in a marked increase in albumin degradation during the methadone-maintenance period. Reprinted by permission from the Williams & Wilkins Co., Baltimore, Md. (Rothschild, M. A.; Kreek, M. J.; Oratz, M.; et al. Gastroenterology, 71:218, 1976. Copyright © 1976).*



albumin synthesis. This very intriguing and unique physiological effect is being studied further, both to delineate the mechanisms of this effect and to determine whether or not narcotics in general share such an effect on albumin synthesis.

Diverse, and conflicting conclusions have resulted from data collected from various acute and subacute studies in animals of methadone effects on neurotransmitters and on neurological function in general. Most of this information is not applicable in any way at this time to a consideration of the physiological effects of chronic methadone treatment in man. Certainly, more animal studies in different species using appropriate doses of methadone on a chronic basis may provide needed insight for planning clinical studies. However, one set of observations concerning neurological function have been made in monkeys following chronic treatment which might have some applicability to man. Dyskinesias, very similar to tardive dyskinesia seen in humans, especially in older age groups in conjunction with long-term use of neuroleptic agents, such as chlorpromazine, which blockade dopamine receptors on a chronic basis, were seen in monkeys given methamphetamine 10 days following chronic treatment with methadone (Eibergen and Carlson 1975, 1976). These dyskinesias did not occur spontaneously following cessation of methadone treatment, however. Patients who receive amphetamines for some medical indication after detoxification from methadone treatment should be carefully observed for possible appearance of such dyskinesias.

In clinical studies reported to date, no neurological or intellectual functioning abnormalities or deficits have been demonstrated in patients receiving chronic methadone treatment (Gordon and Appel 1972; Lenn et al. 1975-76; Appel and Gordon 1976; Lombardo et al. 1976; Grevert et al. 1977).

To date, there have been no indications of significant acute or any chronic physiological effects of methadone on cardiovascular, renal, or other organ or functional systems during chronic treatment with methadone. After 10 to 14 years of followup studies in adult patients and 5 to 7 years of followup studies in adolescent patients in chronic methadone treatment, no toxic or serious adverse effects due to methadone itself have been documented, with the exception of one case of fatal constipation (Kreek 1973a; Kreek 1978b; Rubenstein and Wolff 1976; unpublished observations of Kreek, M. J.; Khuri, E.; Millman, R.; et al.). Thus, the implications for treatment are that methadone (and hopefully any long-acting narcotic congener) appears to be safe, even when used in high doses (80-120 mg per day), for long-term treatment of opiate addiction.

As noted throughout this review, however, there are many exciting and potentially important areas for future research, both basic and clinical, on the physiological and pharmacological effects of methadone as used in chronic treatment of addiction. Of especial interest for future research will be the attempts to correlate exogenous narcotic disposition, endogenous endorphin-receptor interactions, and feedback mechanisms with observed physiological effects and with the phenomenon of the development and maintenance of tolerance and dependence. Such research may yield new insights into a better understanding of the biology of the addictive diseases.

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7. The Use of LAAM in Treatment

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INTRODUCTION

Knowledge about the use of LAAM (levo-alpha-acetylmethadol) in treatment of narcotic addiction has not been widespread among clinicians dealing with drug abusers. This chapter will therefore include background material and descriptions of very early clinical studies examining its pharmacological properties and potential analgesic use, a review of recent studies and ongoing cooperative programs, a discussion of issues in the context of clinical investigations, and suggestions for further research.

BACKGROUND AND EARLY INVESTIGATIONS

Although interest in LAAM as a long-term treatment agent for chronic addiction did not emerge until the late 1960s, its synthesis and early investigations of its toxic and analgesic properties were carried out as early as 1948. Chen (1948) first reported its analgesic effects in animals, and noted its delayed onset and long duration of action as compared to the d-isomer. This unique time-response characteristic has been attributed to its biotransformation via N-demethylation to two active metabolites, noracetylmethadol (N-LAAM) and dinoracetylmethadol (DN-LAAM) (Billings et al. 1974). The location of the demethylating enzyme in the liver accounts for the more rapid onset of action after oral, as compared to parenteral, administration.

The first clinical interests in LAAM were in its possible use as an analgesic. In acute clinical trials, Keats and Beecher (1952) administered LAAM subcutaneously and observed analgesia within 90 minutes, but the analgesia was less than that produced by 10 mg of morphine, and doubling the dose did not increase analgesic activity during the period of observation. By extrapolation, they estimated the analgesic dose equivalent to 10 mg of morphine to be around 30 mg to 50 mg of LAAM. However, when higher doses were used, they encountered four cases of coma which appeared to be related to oversedation. They concluded that there was no indication of longer analgesic action of LAAM compared to morphine, and felt it was not desirable to introduce into clinical medicine an agent with such serious effects. David et al. (1956), on the other hand, reported favorable results using d-l-alpha-acetylmethadol in patients with chronic pain. Doses of 5 mg to 10 mg given orally or subcutaneously 3 to 4 times a day were effective and well tolerated. Transient nausea and vomiting seen in some patients were controlled with chlorpromazine. Constipation was troublesome with daily doses above 30 mg. Tolerance seemed slow to develop with the dosage range employed. No acute overdose was observed in this study, but the overwhelming majority of their patients had been receiving narcotics at the onset of the trial.

In a series of studies carried out on postaddicts at the Addiction Research Center, Lexington, Ky., Fraser and Isbell (1952) examined the addiction liabilities and pharmacologic actions of LAAM. With subcutaneous injection of 10 mg to 30 mg they noted no morphinelike effect for the first 4 to 6 hours; thereafter, very striking effects became apparent and persisted for as many as 48 to 72 hours.

Intravenous administration yielded results similar to subcutaneous administration. With oral administration, the effects appeared much more quickly, within 1 to 1½ hours, and persisted in some instances up to 72 hours. Repeated administration of 15 mg LAAM subcutaneously twice daily for 3 days led to cumulative toxicity manifested by severe nausea and vomiting, confusion, respiratory depression, and altered consciousness approaching coma.

Subcutaneous administration of LAAM resulted in inconsistent relief of morphine abstinence, but a single oral dose of 30 mg to 60 mg administered 28 hours after the last dose of morphine completely abolished all symptoms of abstinence in patients who were stabilized on 400 mg morphine daily.

Acute substitution of LAAM for morphine was adequate when 1 mg LAAM orally was substituted for 6 mg morphine. Sixty mg of LAAM was adequate in suppressing abstinence for up to 72 hours for patients stabilized on 60 mg morphine four times daily. An abstinence syndrome similar in intensity and time-course to abstinence from methadone appeared with abrupt discontinuance. Gradual reduction over 7 days did not seem to alter the subsequent course and intensity of abstinence.

The greater efficacy when administered orally, and the long duration of action led Fraser and Isbell to suggest that LAAM might be advantageous over other narcotic analgesics if it could be shown that the duration of its analgesic effect is as great as its physical dependence supporting actions. They further suggested that LAAM might be useful in the treatment of chronic pain, but cautioned that if used clinically it should be administered orally in small doses and at widely separated intervals in order to prevent cumulative toxic effects. They felt that LAAM had no advantage over methadone in withdrawing addicts from morphine, since oral methadone had been shown to be effective in suppressing morphine abstinence. It must be appreciated, however, that the idea of long-term maintenance treatment for narcotic addicts with such agents as methadone or LAAM did not emerge for at least another decade.

USE OF LAAM IN TREATMENT—EARLY CLINICAL TRIALS

Clinical interest in LAAM reemerged in the late 1960s with the growing popularity of methadone maintenance and the proliferation of methadone maintenance clinics. Some clinicians became concerned with the limitations of methadone maintenance due to methadone's relatively short duration of action, necessitating daily ingestion of medication. Daily clinic attendance interferes with efforts in rehabilitation. On the other hand, allowing addicts to take methadone home led to the appearance of cases of accidental poisoning and primary methadone addiction from street diversion of these take-home medications. The need to find a longer acting methadone substitute became increasingly felt.

The first clinical trials using acetylmethadol in a narcotic treatment program were carried out by Jaffe and his coworkers in Chicago in the late 1960s and early 1970s (Jaffe et al. 1970; Jaffe and Senay 1971; Jaffe et al. 1972; Senay et al. 1974). In one double-blind study with 21 methadone maintenance patients, they substituted d-l-acetylmethadol at 1.2 times the usual methadone dose on Monday, Wednesday, and Friday and found no difference between the experimental and control groups with respect to relief of withdrawal symptoms, illicit drug use, and social adjustment after 7 weeks (Jaffe et al. 1970). In another double-blind study (Jaffe et al. 1972), 34 new patients were studied for 15 weeks, using either 30 mg to 80 mg d-l-acetylmethadol three times a week, or 30 mg to 80 mg methadone daily. There were no significant differences between the two groups as reflected by dropout rate, employment, arrests, illicit drug use, clinic attendance, and requests for dose changes. Most patients required a higher dose of LAAM on Fridays. The clinic physician who was blind to the study could not distinguish between the LAAM and methadone groups. Jaffe and Senay (1971) also substituted 1.3 mg LAAM on Fridays on three consecutive weekends for 1 mg of daily methadone in a group of 10 patients stabilized on methadone and found no differences between the experimental and the control groups in terms of subjective complaints and in several objective measures.

In a later report, the Chicago group successfully treated addicts with LAAM for up to 48 weeks (Senay et al. 1974). Other clinical studies were reported by Blachly (1971), Zaks et al. (1972), Irwin et al. (1973), Goldstein and Judson (1974), and Savage et al. (1976). Lehman (1976) administered LAAM to young addicts aged 16 to 21 every 72 hours as a temporary chemotherapeutic support. Some discomfort was complained of by patients after 60 hours. Symptoms were generally mild and did not require changes in dosage. Patients were withdrawn from LAAM at the end of 16 weeks.

The overall results of these studies revealed few differences between LAAM and methadone in terms of illicit drug use, employment, clinic attendance, illegal activities, arrests, etc. They confirmed Fraser and Isbell's earlier observation that LAAM is capable of suppressing abstinence symptoms for up to 72 hours. The dose levels used were somewhat higher on Fridays in several studies, but complaints of weekend discomfort were not always related to medication. Goldstein and Judson (1974), for instance, observed no consistent effect on these complaints by increasing Friday LAAM doses from 75 mg to 100 mg on a blind basis.

There were very few reports of clinical toxicity in all these studies. Side effects were generally those observed with other opiates and included such complaints as nausea, vomiting, constipation, excessive sweating, decreased sexual interest, and delayed ejaculation. Others complained of symptoms of withdrawal early in treatment; some complained of drowsiness and nodding from oversedation. Several reports of adverse reactions occurred in patients who received large doses of LAAM. Keats and Beecher (1952) observed four cases of coma which they attributed to excessive medication. Blachly (1971) reported seizures in two patients receiving 120 mg and 180 mg LAAM every 24 hours. A female patient on 110 mg LAAM daily lost consciousness and suffered cardiac arrest, and a patient on 220 mg LAAM daily complained of feeling as if he were going to have a fit (Blachly 1971). Blachly (1971) also reported a case of manic attack when a patient's dose was reduced from 55 mg every 48 hours to 35 mg every 48 hours. Laboratory results revealed few differences between LAAM and methadone patients and between pretreatment and posttreatment values.

These studies provided sufficient evidence of safety and efficacy of LAAM to justify clinical trials on a larger scale. As a group they are considered to be prephase II trials by the Food and Drug Administration (FDA), in contrast to the two multiclinic cooperative studies discussed below, although some of them have been quite recent, notably those by Senay et al. (1974), Goldstein and Judson (1974), and Savage et al. (1976).

THE VA AND SAODAP PHASE II COOPERATIVE STUDIES

Description of the Studies

Between 1973 and 1976 two cooperative LAAM studies were carried out in over 25 clinics to assess the safety and relative efficacy of LAAM as compared to methadone. These studies were planned to complement each other and were similar in design but also differed significantly in several respects. The first of these was conducted in 12 Veterans Administration hospitals and will be identified here as the VA study. The second involved 16 non-VA clinics (except Sepulveda VA Hospital Clinic which participated in both). This latter study will be identified as the SAODAP study because it was sponsored by the Special Action Office for Drug Abuse Prevention. Dr. Samuel Kaim, then Director of the VA Alcohol and Drug Abuse Service, was instrumental in the planning and initiation of the VA study. Dr. C. James Klett acted as sponsor for the SAODAP study and provided central coordination for both studies. However, many individuals from SAODAP, the National Institute on Drug Abuse (NIDA), FDA, and the Drug Enforcement Administration (DEA) played important roles throughout the studies, and in many ways these clinical trials best exemplified the accomplishment of interagency cooperation in a common effort.

The VA study was a double-blind study which compared 80 mg LAAM given three times a week with two dose levels of methadone, 50 mg and 100 mg given daily. Thus, a secondary goal was to compare a low dose (50 mg per day) to a high dose (100 mg per day) of methadone. Subjects were male street-heroin addicts between the ages of 18 and 60, i.e., addicts not currently on methadone maintenance. They were randomly assigned to one of three study groups, all of whom began with a 30 mg dose of either LAAM or methadone, and the dose was incremented by 10 mg per week until they reached their respective stabilization dose. Patients on LAAM received a placebo on nonmedication days. Length of treatment was 40 weeks (Ling et al. 1976).

In the SAODAP study, patients were also males and were already maintained on methadone at the time they were admitted to the study. Dosage was flexible rather than fixed, in contrast to the VA study, and the trial was open rather than double-blind. Patients were randomly assigned to either methadone or LAAM. Length of treatment was also 40 weeks (Ling et al. 1978).

In both studies, patients were evaluated at baseline and every 4 weeks during their tenure in the study. The evaluation included a brief history and physical examination, a current status record of their employment, legal involvement, interpersonal relationships, and drug use during the preceding 4 weeks; a supplementary medication record of all drugs prescribed during the preceding 4 weeks; and a symptom-sign checklist (weekly for the first 8 weeks and every 4 weeks thereafter).

Vital signs and body weight were recorded on these occasions, and blood and urine samples were obtained for laboratory analyses. Patients' adherence to clinic schedules and details of medication dispensed were recorded on each clinic visit. Random weekly urine samples were tested for a variety of drugs of abuse. Whenever a patient concluded treatment, an attempt was made to repeat all evaluations, and the staff recorded their consensus judgment of outcome in a number of different areas.

A similar monitoring system for the patients' safety during the study was adopted for both studies. The first level of medical responsibility rested with the principal investigator at each participating clinic. He determined the patient's suitability for admission and continuation in the study and reviewed all laboratory data before submission for central processing. Once every few weeks, the laboratory results of all study subjects were listed and reviewed for significant individual variations or group changes. Every 3 to 6 months, the aggregate data were subjected to statistical analyses for cross-sectional variations and longitudinal trend development. These analyses were provided to a panel of experts independent of the study groups (the Operations Committee in the VA and the Medical Advisory Committee in the SAODAP study). Twice a year, all the principal investigators met to discuss their clinical impressions and review any deaths or significant adverse reactions. Finally, the data were reviewed by an independent physician through a NIDA contract.

Four hundred and thirty patients participated in the VA study. One hundred and forty-six were assigned to 50 mg methadone (M-50), 142 to 100 mg methadone (M-100), and 142 to 80 mg LAAM (L-80). Six hundred and thirty-six patients entered the SAODAP study with 308 on methadone and 328 on LAAM.

Results

Forty-two percent of the starting sample completed 40 weeks of treatment in the VA study. Early termination occurred in 69 percent from the LAAM group, 58 percent from the M-50 group, and 48 percent from the M-100 group.

There were 49 percent completers in the SAODAP study. When all reasons for early termination were combined, 61 percent terminated early in the LAAM group and 40 percent from the methadone group. Patients assigned to LAAM not only terminated prematurely in greater numbers than the methadone patients, but they did so earlier in the study. The clinical implication of these observed differences will be discussed in greater detail in a later section of this chapter. However, the difference between premature termination from LAAM and from methadone treatment must be made clear emphatically at this juncture. Since virtually all the LAAM terminators return to methadone, we have in fact lost nothing as far as clinical treatment of these patients is concerned; they simply return to an existing treatment system. In contrast, patients terminated prematurely from methadone do not go to LAAM but are lost from the treatment system altogether.

Clinical Safety

There were no deaths in the VA study. Two deaths occurred in the SAODAP study, one from a gunshot wound received while attempting a robbery, and the other was judged to be an alcohol-related death that occurred within 24 hours after the patient was terminated from the study and hospitalized because of his excessive use of alcohol. No serious adverse reactions were reported in either study.

Eight VA and 11 SAODAP patients dropped out for reasons primarily related to side effects. These included severe constipation, nausea after medication, inability to ejaculate and loss of sexual interest, headache, swelling of lower extremities, dizziness, blurred vision, and hypnagogic myoclonus. Two patients with prior history of heavy psychedelic drug use complained of an amphetaminelike reaction within a few days after starting LAAM in the open study. One patient terminated because of his wife's complaining of his hyperactivity. No pattern emerged from the side effects reported. However, this is a relatively small group in which to discern a pattern, if in fact one exists.

The symptom-sign data were collected weekly for the first 8 weeks and every 4 weeks thereafter using a schedule consisting of 30 items and an "other" category. This schedule was factor analyzed when sufficient data had accumulated and a three-factor solution accepted as the best representation of the data. The first factor (14 items) related to underdosing, the second factor (5 items) related to overdosing, and the remaining 11 items made up a "somatic" third factor. In the VA study, no significant differences were seen between the two drugs in one series of analysis. In another series of analysis, ach-

98

ing bones and joints, insomnia, and anxiety occurred significantly more frequently in the M-50 group. On 26 of the 31 symptoms-signs, the LAAM group was equal to or lower than whichever methadone group had the greatest number of severe ratings.

Although delayed ejaculation seemed to be associated with the L-80 patients in the early termination data in the VA study, this was not supported by the symptom-sign data where ratings of moderate or severe or both on impotence, decreased sexual interest, and delayed ejaculation were all more frequent (but not significantly so) in the methadone groups. Another symptom, irritability, being of special interest because of its observation in animal studies, occurred more frequently in the methadone groups but not significantly so.

In contrast to the double-blind VA study, symptoms occurred, understandably, predominantly in the LAAM group in the open SAODAP trial.

Laboratory values obtained at prestudy, every 4 weeks during the study, and at termination, were subjected to cross-sectional and longitudinal analyses. A slight weight gain of several pounds was noted in all three drug groups in the VA study, but this was not apparent in the SAODAP study. In both studies there appeared to be a very slight downward adjustment of hematocrit and to a lesser extent hemoglobin and red blood cells in the early weeks of the study, with restabilization at a somewhat lower level. All the laboratory values were well within the limits of normal, and there was no clinical anemia noted in either study. Although a large number of subjects showed abnormal liver-function tests on admission, there did not appear to be any time-drug interaction, and the vast majority of values remain stable throughout the trial period for both LAAM and methadone groups.

Clinical Efficacy

The fact that a large number of patients were maintained on LAAM for extended periods without experiencing undue discomfort must be taken as prima facie evidence of the efficacy of LAAM as a maintenance drug. Using a weighted-urine index which takes into account the frequency as well as pattern of drug use, high-dose methadone (100 mg) and LAAM (80 mg) patients used significantly less illicit opiates as compared to those on low-dose (50 mg) methadone in the VA study. No advantage emerged for either group in the SAODAP study. These findings correlated with clinic attendance and the global rating of improvement as judged by the treatment staff.

We concluded from these findings that LAAM is a safe and efficacious alternative to methadone for maintenance treatment of chronic opiate addicts under the conditions of these studies.

Two SAODAP Substudies

In several clinics in the SAODAP study, patients receiving methadone Mondays through Thursdays and LAAM Fridays were compared to a daily methadone control group. One hundred and thirty-six patients entered the study, with 65 randomized to LAAM and 71 to methadone. Fifty percent of methadone patients and 35 percent of LAAM patients completed 40 weeks of treatment. Heroin use as determined by urine tests was comparable in the two groups as was the global rating of improvement, but there were considerably more complaints of physical discomfort by patients on Friday LAAM.

In another substudy, patients who had completed 40 weeks in the SAODAP study were given the option to remain in a continuation study for an additional 40 weeks. Those who chose to remain in the study were further given the option of remaining on their original study drug or switch to the other drug.

Of the 314 potential participants, all but 40 chose to continue. One hundred and twelve LAAM and 124 methadone patients chose to remain on their original drug. Thirty-three additional methadone patients chose to switch to LAAM and 5 LAAM patients switched to methadone. This continuation study provided long-term safety data of LAAM for up to 80 weeks (Ling et al. in press).

PHASE III CLINICAL STUDY

Under a contract to NIDA, Whysner Associates is presently conducting a large-scale phase III study in some 60 clinics aiming at obtaining 40-week clinical experiences with 2,000 LAAM patients and a suitable methadone control group. Several protocols are being used. In one protocol all patients are assigned to LAAM maintenance. In another, 60 percent of the patients are assigned to LAAM and 40 percent to methadone. In a third protocol, several methadone to LAAM cross-over schedules are being examined (Whysner et al. 1978, Blaine et al. 1978).

Thus far, nearly 2,500 patients have entered the study with approximately 80 percent previously on methadone maintenance and 20 percent inducted directly from the street. The probability of reten-

99

tion appeared somewhat more favorable compared to previous studies, and safety data continues to be reassuring. There is some early indication that retention rate can be improved by using different cross-over schedules. More importantly, perhaps, this large-scale trial provides an opportunity for a large number of clinicians to work with LAAM in the clinical setting and to gather information on unusual reactions of a low incidence which are likely to be missed in smaller trials. In this respect, the phase III trial resembles many postmarketing surveys.

CLINICAL IMPLICATIONS

Why LAAM?

Perhaps the best argument for using LAAM in narcotic treatment programs is that its use may eliminate take-home methadone, or at least reduce it substantially. This not only protects the community from the hazard of street methadone but also benefits the patients in ways that are less apparent but nonetheless quite important. For instance, victims of accidental poisoning are most often members of the patient's own family; eliminating take-home doses protects them from such risks. Eliminating take-homes also removes from the patient the pressure and temptation to sell or give away part of his/her medications. It also eliminates the possibility of theft or other losses of medication from his/her possession. From the clinician's standpoint, eliminating take-homes removes any incentive from a patient to obtain more drugs than s/he needs and makes dosage bargaining unnecessary. It also removes from the clinic routine the many games and tricks designed to cheat and defeat the urine-testing procedure upon which the granting of take-home privileges all too often rests. The clinician is freed from the dilemma of having to decide whether or not to give patients take-home methadone which may jeopardize the community and the patient, or to deny this privilege and hamper rehabilitation.

In clinics which do not give take-home methadone, the use of LAAM reduces the number of clinic visits from seven to three times per week, giving patients more time to engage in other efforts of rehabilitation. For some patients, methadone does not suppress abstinence for a full 24 hours. They often arrive at the clinic on the verge of suffering from withdrawal, feeling irritable and anxious. Many confrontations between patients and clinic personnel occur under these circumstances. Shortly after ingesting methadone, however, they appear to be oversedated. The longer time-course of the action of LAAM provides a smoother and more sustained drug effect and relieves patients of this daily physiological seesaw. Thus, many patients feel more alert and emotionally more stable on LAAM.

Many patients on methadone become so accustomed to the routine of ingesting a drug daily that they cannot function otherwise. Because LAAM requires less frequent ingestion, it should help to break this ritual and decrease the degree of psychological dependence. The delayed onset of the psychopharmacological effects of LAAM makes it less likely to reinforce drug-seeking behavior for those who must be maintained on it. It is also less likely to be abused by street addicts because of its lack of immediate gratification upon administration.

For the clinic the use of LAAM means simplifying the logistics of drug handling, storage and bookkeeping, and improving accountability. It frees the staff to engage in more therapeutic activities with patients and may expand their treatment capacity.

In summary, the use of LAAM should result in a net saving of lives and may improve the cost-effectiveness of treatment.

How Safe Is LAAM?

We think the evidence is clear that LAAM is as safe as methadone and can be used safely in long-term treatment of chronic heroin addicts. Since LAAM is a narcotic, it possesses all the usual effects, side effects, and possible adverse reactions seen in other opiates. The incidence of side effects appears comparable between LAAM and methadone.

Needless to say, LAAM is addictive and tolerance develops with repeated use. An abstinence syndrome similar in time-course to that seen in methadone had been described in some early studies (Fraser and Isbell 1952). However, several investigators reported in the phase II studies that some patients were able to discontinue LAAM abruptly without undergoing withdrawal. These clinical observations have not been confirmed by controlled trials.

No significant adverse effects of LAAM have been observed on routine clinical laboratory studies including CBC, urinalysis, and the SMA-12 panel. An early clinical report of the hyperglycemic effect of LAAM has not been confirmed by more recent investigations.

In a small series of patients we have observed no significant effect on thyroid function. No significant EKG changes were seen in a large series of patients treated with LAAM for 12 weeks (Towery and Rios, n.d.).

It should be pointed out that most published clinical safety data on LAAM have been derived from relatively healthy male heroin addicts, although a number of other medications were concurrently prescribed to patients in the phase II studies without serious interactions. Patients with other illnesses have been included in the ongoing phase III study and the data have continued to be reassuring.

So far very few women have been treated with LAAM, too few to allow any definite statement regarding safety in females. Its effect on the human fetus, if any, remains unknown.

How Should LAAM Be Used Clinically?

At present, LAAM is only available to clinicians under approved investigational protocols. Hopefully it will be approved for general use in the near future. Its use must be restricted to patients with an established history of chronic opiate addiction and evidence of current physical dependence. Although there are no regulations or guidelines imposed on LAAM by the FDA, we have found the FDA guidelines for methadone maintenance useful in selecting patients for LAAM treatment.

No recommended optimal method of induction for street-heroin addicts is currently available, although in general the beginning doses should be small, 20 mg to 30 mg p.o. three times per week, depending on the degree of physical dependence. Where there is doubt, a more conservative attitude should be adopted using a smaller starting dose. Dosage may be incremented by 10 mg every other dose or every dose, depending on the patient's clinical response, until a stabilization dose of 50 mg to 80 mg is reached. The more rapid induction schedule has been shown to be safe in experienced hands. Dr. Avram Goldstein, for instance, has successfully inducted several hundred patients with this method without difficulties.[1] It goes without saying that patients must be closely observed during this period and that they must have a sufficient degree of tolerance to opiates to begin with. A somewhat higher dose may be used for the third dose of the week which must last the patient 72 hours. Only a portion of patients will need this higher dose and for most an increase of 10 mg to 20 mg will suffice. Few patients required up to 50 percent higher than the regular dose and these should be managed judiciously.

Patients who are already on methadone maintenance may be switched to LAAM using a cross-over ratio of 1.0 mg to 1.3 mg LAAM three times a week for each milligram of daily methadone. No optimal cross-over schedule has been established but several are under investigation. Our current practice is to use a higher cross-over ratio for patients maintained on lower doses of methadone and vice versa. A somewhat higher dose also may be given on the day that the medication must last the patient 3 days. A target stabilization dose of 80 mg three times per week is currently recommended, although individualization will obviously be needed for each patient.

No LAAM has been allowed to leave the clinic. Whether take-home doses will be allowed in the future will depend on a number of considerations. Perhaps the lack of immediate gratification after dosing would make it less subject to street abuse and therefore safer in that respect. On the other hand, its delayed time-course probably makes it more dangerous until the drug-culture population becomes knowledgeable about this unique property of LAAM.

Patients should be educated to expect a period of adjustment of 2 to 3 weeks following initation of LAAM treatment and be reassured that the initial discomfort will improve with time.

Like all opiates, the major problem with LAAM is acute overdose, and the threat is always present whenever LAAM is used. The delayed onset of action warrants a special note of caution. Patients should be specifically made aware of this unique property of LAAM and be warned against using additional opiates and other central nervous system depressants for several hours after ingestion of the dose. They need to be cautioned against combining LAAM with alcohol and other psychoactive drugs, especially central nervous system depressants.

In the few instances of acute LAAM overdose we have been impressed by the relative ineffectiveness of naloxone given in the customary dosage for acute heroin poisoning. Much higher doses may be necessary and patients need to be treated for a much longer period of time relative to overdose from heroin or methadone, possibly up to 72 hours. Cases of acute overdose are apt to occur in individuals without significant tolerance to opiates. The added danger here is that the delayed onset of LAAM is not generally appreciated by addicts, and additional doses of LAAM or other drugs are taken which combine with LAAM to produce a massive overdose when the effect of the latter becomes manifest in a few hours.

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[1] A. Goldstein, 1978 personal communication.

Is LAAM Effective?

Elsewhere we have argued that the large number of patients being treated successfully with LAAM is evidence that it is effective. Illicit drug use has been comparable between patients treated with LAAM and methadone, which to us indicates that they are similar in their ability to suppress drug hunger, prevent abstinence, and decrease drug-seeking behavior. Employment and other social adjustments have also been comparable. The observed difference in relative program retention in our view does not indicate LAAM is less effective. As pointed out elsewhere (Ling et al. 1976, 1978; Klett 1977), program retention is a most unsatisfactory criterion of effectiveness, as it is related to so many other factors. In an open trial, as was the case with the SAODAP study, program retention is totally worthless as a criterion of efficacy for the obvious reason that the option to return a LAAM patient to methadone is always open but the reverse is not.

It is quite likely that the higher dropout rates in LAAM patients are related to our relative inexperience with this drug, especially during induction and cross-over from methadone. Early results from several ongoing studies designed to improve our knowledge in this area appear to support our belief that this is the case (Blaine et al. 1977). Naturally we cannot expect the current studies to provide us with the best methods of induction and cross-over. Rather, we hope this experience will provide some general guidelines for clinicians in their initial experience with LAAM and give them some degree of confidence in the management of their patients. One may benefit from remembering the adjunctive nature of drug treatment under these circumstances. A clinician who is aware of what has been done safely and with some success is likely to be more confident and consequently more effective clinically.

Eventually we expect each clinician will evolve his own particular technique as his experience accumulates. That factors other than a certain induction or cross-over schedule influence program retention has been amply demonstrated by the multiclinic phase II studies, where retention varied widely from clinic to clinic in spite of the use of a common protocol.

Perhaps consumer acceptance will be the ultimate criterion of the clinical efficacy of LAAM. So far the evidence has been that LAAM is acceptable to large numbers of heroin addicts. In fact, some may prefer it to methadone. In the SAODAP study, when 128 patients who completed 40 weeks of LAAM treatment were given the option to continue LAAM or to return to methadone, an overwhelming majority of them (89 percent) chose to stay on LAAM. More recently, Dr. Goldstein's group compared preference for LAAM and methadone among their clinic patients who had at least 3 months' treatment experience with both drugs and found that their patients also preferred LAAM in many respects (Trueblood et al. 1978).

There appears to be strong evidence that LAAM is effective as a maintenance drug, that it is acceptable to most addicts, and may be preferred by some.

SOME ISSUES FOR FUTURE INVESTIGATION

There remain a number of unanswered questions, some of which undoubtedly require further studies. We have already mentioned the lack of experience with female patients and this would be an important area to accumulate more experience. Sooner or later we must address the question of pregnancy and the effect of LAAM on the fetus and the newborn. These questions need to be examined carefully in the female study.

Can LAAM be used advantageously in the detoxification of street-heroin addicts? The question does not seem to require any immediate answer clinically, since methadone does appear to be an adequate detoxification agent. Nevertheless, it is one of the missing aspects of our knowledge of LAAM that may warrant further study.

We still do not have any substantial data on induction and cross-over from methadone, but several ongoing studies should provide more information in this respect. A consortium of five clinics is also examining the question of detoxification from LAAM and using LAAM to detoxify patients off methadone. There have been some anecdotal reports that detoxification from LAAM maintenance may be easier than from methadone, but this has not yet been systematically examined. We have looked at restabilization on methadone after LAAM maintenance in a double-blind study and have encountered no difficulties.

102

The pharmacokinetic data on LAAM remain incomplete and more work is being planned. We have observed considerable variations in the level of metabolites in a small series of our patients. However, determination of serum metabolic levels may prove useful in certain cases with unexpected or unusual clinical responses.

We have examined the correlation between blood levels of LAAM and its two major metabolites and the patients' behavioral responses and cognitive functions in several areas. The data are still being analyzed from this study. Dr. Goldstein's group has recently published a study of the effect of LAAM on memory function and has found no memory deficit after 1 to 3 months of LAAM treatment (Grevert et al. 1977), but there may be some other aspects of cognitive function that would be worthy of further examination to see if they are related to the serum levels of LAAM or its metabolites.

CONCLUSION

Investigations in the past decade have established LAAM as a safe and effective maintenance treatment agent for chronic opiate addiction. It is an acceptable alternative to methadone and has certain advantages over the former because of its longer duration of action. Current research efforts will undoubtedly add to our knowledge and make it an even more effective treatment adjunct in the near future.

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8. Treatment of Opioid Dependence with Narcotic Antagonists : A Review and Commentary

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Narcotic antagonists are compounds that selectively block the euphoric and physiologic effects of morphinelike drugs (opioids), such as heroin and methadone. The narcotic antagonists used for treating addiction, cyclazocine and naltrexone, are not themselves addicting and have no abuse potential or black market value. When administered to an individual who is physically dependent on opioids (i.e., addicted), a narcotic antagonist will precipitate the familiar opioid abstinence (withdrawal) syndrome. This syndrome can be reversed by a large dose of an opioid substance (Volavka and Resnick 1976). However, if a person who is no longer physically dependent on opioids takes a narcotic antagonist, he will be protected against readdiction; even if heroin is used, he will experience no euphoria and will not develop opioid dependence. Having this protection, the person can return to the community, where rehabilitation can take place, despite the endemic presence of heroin or other opioids.

The potential usefulness of narcotic antagonists in helping former opioid addicts to remain abstinent was first suggested by Martin et al. (1966) after studying the clinical pharmacology of cyclazocine. These investigators found that cyclazocine provided blockade of opioid effects for as long as 24 hours following a single oral dose and prevented the development of physical dependence from repeated injections of morphine. They suggested that maintaining a detoxified opioid addict on cyclazocine would control the pharmacologic actions responsible for addiction and provide an opportunity for extinction of conditioned physical dependence and drug-seeking behavior (Wikler 1965, 1973).

In addition to its opioid blocking action, cyclazocine produces analgesia and dysphoric side effects. The latter are characterized by sedation, visual distortions, and racing thoughts. Tolerance develops to these side effects but not to the narcotic-blocking action of cyclazocine. Abrupt discontinuation of cyclazocine after chronic administration results in characteristic withdrawal effects, but unlike opioid withdrawal, these effects are not associated with drug-seeking behavior.

Early clinical trials revealed that cyclazocine's dysphoric side effects limited its acceptability to patients (Jaffe and Brill 1966; Freedman et al. 1967, 1968). These side effects could be minimized, however, by gradual increments in daily dosages over a period of approximately 21 days. Even with this gradual induction schedule, some patients, particularly those with a history of schizophrenia, experienced dysphoric effects from cyclazocine. Based on a report by Jasinski et al. (1968) that side effects of cyclazocine were blocked by the short-acting "pure" antagonist, naloxone, Resnick et al. (1971) demonstrated how naloxone could be used to shorten the cyclazocine induction period to 4 days.

Cyclazocine was not acceptable for large-scale clinical trials because of its side effects. Continued interest in the potential role of narcotic antagonists for treating opiate dependence led to the synthesis of naltrexone (Blumberg et al. 1967), with the expectation that it would be a "pure" antagonist like naloxone but would have cyclazocine's duration of action. Initial trials in humans showed that naltrexone had few side effects and that a single dose provided effective blockade to opiates for up to 72 hours (Martin et al. 1973; Resnick et al. 1974). Thus, taking naltrexone three times weekly is sufficient to maintain a fairly high level of opioid blockade. The absence of unpleasant side effects obviates the need for an induction period.

In response to a 1971 mandate from Congress to expand research on antagonist drugs for the treatment of heroin addiction, naltrexone was selected over other available compounds for extensive clinical testing. The responsibility and cost of this entire effort was assumed by the Federal Government so that naltrexone could be approved by the Food and Drug Administration for general use. Seventeen clinical programs were funded to study naltrexone using a variety of protocols. A progress report of these studies, which include 776 patients who received naltrexone and 107 placebo controls, is contained in a NIDA Research Monograph (Julius and Renault 1976). The results of these studies and others (Volavka et al. 1975, 1976), show no evidence of toxicity from naltrexone. Fertility appears to be unaffected by naltrexone, and no evidence of teratogenic effects has been found (Braude and Morrison 1976).

THEORETICAL BASIS

The theoretical basis for the use of narcotic antagonists in treating opiate addiction was developed by Wikler (1965, 1973), who postulated that conditioning factors are responsible for the relapse to heroin use in detoxified addicts. He proposed a two-factor learning theory of relapsing behavior, based upon the principles of operant (instrumental) and Pavlovian conditioning. Wikler suggests that the euphoria and relief from physical and emotional distress provided by an injection of heroin are powerful "reinforcers" that establish and maintain the opiate-using behavior through the process of operant conditioning. Pavlovian conditioning comes into play through repeated pairings between stimuli in the addict's everyday environment and withdrawal symptoms that appear in association with daily heroin use. For example, a former addict who is opiate free for months or even years often experiences a renewed "craving" for heroin and physical withdrawal symptoms upon returning to an environment or meeting up with a friend who was previously associated with his opiate use. This "conditioned abstinence" response can cause the former addict to reinitiate opiate-using behavior and relapse to heroin addiction. According to this model, when heroin is "robbed" of its reinforcing properties by the blocking action of an antagonist, drug-seeking behavior will eventually cease as a result of extinction of previously conditioned responses. These conditioning factors partially explain why treatments without pharmacologic support for compulsive heroin use generally have not been successful; as Wikler observes, there are forces operating of which neither therapist nor patient is aware.

PATIENT SELECTION

From studies with cyclazocine, it became evident that antagonist treatment was not efficacious for all detoxified opiate addicts. Many patients discontinued cyclazocine early in treatment and became readdicted. Clinical impressions suggested that cyclazocine was beneficial to certain types of addicts. Resnick et al. (1970) presented a typological classification of opiate addicts based upon patients' self-ratings of the role opiates played in their daily lives. Two major groups were identified and found to have a differential response to cyclazocine treatment. One group appeared to use opiates as a form of "self-medication" to relieve symptoms of chronic emotional problems or stress. They indicated that heroin reduced their inhibitions, anxieties, and painful affects and perceived themselves as feeling and functioning better with opiates in their systems than during periods when they were opiate free. Usually such patients discontinued cyclazocine treatment prematurely. By contrast, when patients in the other group had no opiates, they reported no symptoms of serious affective disorders and did not have an impaired capacity to function. For them, opiate use seemed to result from environmental influences and conditioning factors. In general, such patients remained in cyclazocine treatment for relatively long periods of time. This study also found that patients involved in a stable relationship with a nonaddict mate were more likely to sustain cyclazocine and remain opiate free than patients who lacked such a relationship.

In a subsequent study, Resnick et al. (1971) found that a patient's choice of cyclazocine over methadone maintenance was as predictive of treatment outcome as selection criteria derived from the typological classification. These authors suggested that a patient's choice of methadone over cyclazocine reflects his awareness of a need for opiates to feel and function normally.

The contribution of psychosocial and drug-history variables to treatment outcome with naltrexone has been examined in several recent studies. The results of these studies show that "success" in naltrexone treatment, defined by opiate-use or retention-time criteria, is more common in patients who are: (a) involved in a meaningul relationship with a nonaddict mate, (b) employed full-time or attending school, and (c) living with family members rather than with friends or alone (Parwatikar et al. 1976; Hurzeler et al. 1976; Landsberg et al. 1976; Lewis et al. 1976; Meyer et al. 1976). Additionally, patients who report longer histories of addiction, longer opiate-free periods between recurrent cycles of addiction, and less dependence on opiates just prior to detoxification, are more likely to be opiate free 1 year from the start of naltrexone treatment (Resnick and Washton 1978).

Although it was hoped that identification of reliable predictor variables would enable clinicians to select for antagonist treatment those patients most likely to benefit from it, none of the variables isolated thus far appears powerful enough to be clinically useful for actually selecting patients. Even if such predictor variables were found, the patient's own choice of treatment modality should be the overriding consideration. When the nature of each treatment alternative is explained fully, any patient who chooses antagonist treatment should be given the opportunity to try it since other modalities can later be used if needed.

TREATMENT OUTCOME

In early clinical trials with cyclazocine, almost all patients relapsed to opiate use within a few months. Retention rates improved, however, when investigators began to use cyclazocine within comprehensive rehabilitation programs that included psychotherapy, counseling, and various ancillary services. Reports on treatment outcome from these programs indicate that between 30 percent and 60 percent of patients inducted onto cyclazocine were opiate free at the time of followup, which ranged from 6 to 27 months (Petursson and Preble 1970; Ladewig 1971; Laskowitz et al. 1972; Resnick et al. 1971; Kleber 1973; Kleber et al. 1974; Kissin et al. 1973). The length of time patients took cyclazocine varied among the different programs, and no control groups were used. Chappel et al. (1971) attempted to assess whether cyclazocine produced any benefits beyond those that would have resulted purely from contacts with the clinical staff. Within the context of an abstinence-aftercare program, these investigators compared patients who received cyclazocine with those who elected not to take it. At 20 months after admission to the program, 33 percent of those who had received cyclazocine were still in abstinence-aftercare treatment, as compared to 8.5 percent of those who had not received cyclazocine.

In the 17 NIDA-funded studies of naltrexone, retention-rate data for 883 patients shows that dropout rates were highest during the first 2 months of treatment and then leveled off (Bradford et al. 1976). Approximately 65 percent terminated medication within the first 3 months, but no outcome information was obtained. Resnick and Washton (1978) reported followup data for 267 naltrexone patients who had received naltrexone for varying periods of time before voluntarily discontinuing it. The results for patients who had been off naltrexone for at least 6 months at the time of followup revealed a clear-cut relationship between time on naltrexone and opiate-free status: 31 percent of those who had taken naltrexone for 3 months or longer were known to be opiate free at followup, as contrasted with only 2 percent of those who had taken naltrexone for less than 3 months. In a subgroup of 81 consecutive admissions for naltrexone, 33 percent were found to be opiate free 1 year following their first dose of naltrexone; the remaining 67 percent were readdicted. The opiate-free patients had taken naltrexone for a significantly longer period of time than those who were readdicted. Similarly, Greenstein et al. (1976) and Lewis et al. (1976) have found that increased time on naltrexone contributes favorably to treatment outcome.

IMPLICATIONS FOR RESEARCH

The possible interaction, in man, of antagonists and agonists with the newly discovered endorphin system (Goldstein and Cox 1977) should be carefully evaluated. Studying the effects of antagonists in ex-addicts and in persons who have never been addicted to opioids may provide valuable insight into the function of the endorphin system, the physiological substrates of addiction, and, perhaps, the appropriateness and indications for opioid and antagonist maintenance.

Apart from the above, there are three major areas concerning the clinical efficacy of antagonists that should be studied. These areas are: (1) the prerequisite detoxification from opiates, (2) the development of new antagonist compounds, and (3) the treatment milieu in which an antagonist is used.

Detoxification

Efforts to facilitate opioid detoxification should be given priority for support because the problems during this period impinge upon all treatment modalities. High dropout rates characterize the final stages of detoxification and subsequent opioid-free period required before an antagonist can be administered. Forty-two percent of the 1,536 patients in the NIDA-funded naltrexone studies did not receive even one dose of medication (Bradford et al. 1976). In one treatment facility, 35 percent of 191 consecutive applicants for naltrexone were unable to complete the prerequisite detoxification from opiates (Resnick et al. 1976).

In an effort to make detoxification as short as possible, Resnick et al. (1977) explored naloxone-precipitated withdrawal as a means for facilitating induction onto naltrexone. It was hoped that by precipitating withdrawal directly, the duration of the abstinence syndrome could be compressed significantly, without increasing its severity to unacceptable levels. As it turned out, patients who participated in this study found the procedure preferable to the more gradual detoxification procedures routinely employed. Patients dependent on low doses of methadone were able to start naltrexone within 48 hours. The finding that naloxone-precipitated withdrawal poses no significant risk to patient well-being has also been reported by Blachly et al. (1975) and Kurland and McCabe (1976), but its usefulness as a routine detoxification procedure is limited because inpatient care is required. More practical procedures aimed at minimizing the stress of opioid detoxification without requiring hospitalization are needed so that more patients who want to try an antagonist can be treated by this modality.

New Antagonists

It is generally believed that antagonists would be more efficacious if their duration of action were extended. The desirability of a longer acting antagonist became evident in studies with cyclazocine; it had to be taken daily at a clinic or dispensed for self-administration since its opioid blocking action was limited to 24 hours. Daily clinic visits sometimes imposed a hardship on patients, particularly those who were employed or traveled long distances to get to the clinic. Take-home doses, on the other hand, often comprised compliance; patients were tempted to skip one day's medication to get "high" on heroin, using the rationalization that it would be "just for that one time." Instead of being an isolated instance of opiate use, however, that "one time" often initiated increased craving for opiates and eventual readdiction.

The problem of noncompliance was solved, in some cases, by having a reliable family member be responsible for administering take-home medication on those days when the patient could not come to the clinic (Resnick et al. 1971). This approach, however, is not feasible for implementation on a large scale and current FDA regulations do not permit take-home doses of antagonists.

Another way to deal with noncompliance is to extend the duration of an antagonist's narcotic-blocking action, thereby eliminating the need for a patient's daily cooperation in taking medication. Naltrexone provides 72-hour blockade without dysphoric effects, but it is believed that an even longer acting preparation would be more efficacious. Research in animals is currently underway to develop and test depot preparations of naltrexone that extend opioid blocking action up to 60 days (Martin and Sandquist 1974; Willette 1976). These preparations are not yet ready for use in humans.

While the idea of a depot antagonist is appealing, it is simplistic to think that it will solve, rather than merely postpone, the problem of a patient's noncompliance. Moreover, before depot preparations are used for treatment, the questions of which patients receive it, and at what stage of their treatment, should be considered. A depot preparation may be contraindicated for patients just starting treatment or those for whom frequent clinic visits for medication provide a needed structure and the opportunity to be engaged in a therapeutic relationship. On the other hand, patients who have already made significant progress toward rehabilitation may be good candidates for a depot implant. It may be indicated, for example, in those who detoxify from long-term methadone maintenance or leave a drug-free therapeutic community.

In addition to continued work on depot preparations, other antagonist compounds should be explored. It often has been assumed that a desirable characteristic for a clinically useful antagonist is the lack of agonist activity, but this assumption has not been tested. Clinical experience with cyclazocine, which is a mixed agonist/antagonist, and naltrexone, which is a pure antagonist, suggests that each of these compounds has certain advantages. Unlike cyclazocine, naltrexone does not produce unpleasant side effects; it is thus more acceptable to patients and obviates the need for an induction period. However, because naltrexone also does not produce withdrawal effects, a patient can discontinue it abruptly without discomfort, before he has developed internalized controls over impulsive opiate use. Cyclazocine can be discontinued without discomfort, but only by gradual dose reductions over a number of days. Because of the necessity to make arrangements for dose decrements in order to avoid cyclazocine withdrawal effects, a patient is more likely to discuss with a staff member his plans to stop medication. These discussions provide the opportunity for a patient to explore with the staff his reasons for wanting to stop medication and to re-evaluate whether or not it is in his best interest to do so at that time.

Based on the above considerations, an antagonist that produces withdrawal effects, but does not have unpleasant side effects, might improve clinical efficacy. Preliminary tests suggest that oxilorphan may have these properties (Resnick et al. 1978). These seemingly desirable pharmacological characteristics alternately might be obtained by a combined regimen of cyclazocine and naltrexone. Naltrexone would be given initially in order to establish immediate opioid blockade. Subsequently, cyclazocine would be introduced gradually. After a maintenance dose of cyclazocine is reached, naltrexone would then be withdrawn and the patient would remain in treatment on cyclazocine. In such a regimen, cyclazocine may be more acceptable to patients than when it was used alone, because naltrexone (like naloxone) may block its dysphoric side effects.

Treatment Milieu

There is a prevailing view among clinicians that psychotherapeutic intervention plays an important role in the retention and rehabilitation of patients in narcotic antagonist treatment. This view is supported by the observations that (a) in early work with cyclazocine retention rates were low but later improved when patients were seen for regularly scheduled counseling, and (b) patients who received naltrexone in conjunction with individual therapy remained in treatment significantly longer than those who received naltrexone alone (Callahan et al. 1976). These observations do not seem surprising in light of the fact that narcotic antagonists change neither the intrapsychic, environmental, or lifestyle problems of which opiate use is symptomatic. Unless these problems are ameliorated, the individual will be predisposed to terminate treatment and become readdicted. Viewed in this way, antagonist medication is seen as only one component of a comprehensive rehabilitation program (Resnick and Schuyten-Resnick 1976). The medication, in itself, is not the whole treatment.

Since the efficacy of antagonist medication seems to be interrelated with nonpharmacologic variables of treatment, it is unreasonable to conduct efficacy studies without identifying and controlling for the most important of these other variables. The relative contributions of antagonist medication and individual therapy to treatment efficacy need to be assessed systematically. Information obtained from such studies may provide a rational basis for the design of future treatment programs and the allocation of funds.

IMPLICATIONS FOR PREVENTION AND TREATMENT

The pharmacologic actions of antagonists uniquely provide prophylaxis against readdiction, so these compounds are particularly well suited for individuals who have progressed in another modality, such as methadone maintenance or a therapeutic community, but who wish to leave that form of treatment. Patients coming off methadone maintenance should be encouraged to use naltrexone during the post-detoxification period, when protracted abstinence symptoms often lead them to reinitiate opiate use. When naltrexone was introduced into a methadone maintenance program, it generated optimism toward attempts to detoxify and provided a reason for patients to remain in abstinence treatment (Haas et al. 1976). For residents of a drug-free therapeutic community who wish to return to their home environment, naltrexone treatment may help them continue the process of gaining self-control over opiate use when the structured lifestyle and peer support of the therapeutic community are no longer present. Naltrexone can be used prophylactically for all individuals who are likely to reinitiate opiate use after a long period of abstinence. For example, cyclazocine and naltrexone have been used in a work-release program with ex-addict inmates (Brahen et al. 1974).

In response to spreading heroin addiction, public health policies have ranged from severe legal penalties such as incarceration of the opiate user, to treatments that sanction opioid dependence through methadone maintenance programs or that proscribe the use of any medications as in therapeutic communities. Narcotic antagonists provide another approach that appears sufficiently efficacious to warrant making them available for use in all addiction treatment programs. Pending the final results of studies on the safety of naltrexone and its subsequent approval by the Food and Drug Administration, there seems at present no valid reasons for excluding naltrexone from any addiction treatment setting. If it is shown to be safe during pregnancy, addicted women should be encouraged to try naltrexone, so that fewer neonates would begin life in withdrawal from opiates.

Although heroin addicts are often perceived in a stereotypic manner, addicted individuals have, in fact, widely different underlying pathologies and life situations. Thus, within any one facility, a variety of modalities should be available so that treatment can be tailored to the individual. No single treatment approach is best for all patients and, moreover, the preferred modality for any one individual may change with the passage of time. Incorporating antagonists into existing programs would provide greater flexibility of treatment. Patients could have the option of moving from one modality to another as their needs dictate, without compromising continuity of care.

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9. Treatment Effectiveness

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After almost a decade of extensive investment in treatment programs for drug dependent individuals, it is appropriate to review both the efforts to evaluate treatment and the information obtained concerning the effectiveness of treatment of drug users in the United States. A literature search revealed numerous reports and publications that addressed evaluation issues, but relatively few of these satisfied the methodological criteria outlined below in the generalized model for evaluation of treatment effectiveness. The studies cited as source data for the conclusions presented in this chapter were selected on the basis of methodological considerations, but space limitations caused the final decisions to be somewhat arbitrary.

Although it is convenient to speak of the "drug problem," it is actually a cluster of related problems, involving a number of discrete categories of drugs with different pharmacology and epidemiology and several categories of users with different drug use patterns and problems. For many years, official and professional concern in this area was preoccupied with opioid addiction, while reaction to problems involving habitual use of other, nonopioid drugs is comparatively recent. In the past decade, Federal funding of treatments for addicts in community-based programs provided initially only for opioid users but was broadened to include users of other drugs as the numbers of new drug users increased.

By and large, however, the treatment programs that were developed and have continued were designed for opioid addicts, and comparable development of treatment designed for youthful nonopioid and polydrug users has not materialized although the problem has been recognized (Comstock and Dammann 1977). As shown in table 1, and in more recent data from the Federal CODAP reporting network (Siguel and Spillane 1977), nonaddict patients and youth under age 18 have been assigned principally to outpatient, drug-free (DF) types of treatment corresponding to DF in the classification used in table 1. A study by Sells and Simpson (1977), based on data from the NIDA-Texas Christian University (TCU) Drug Abuse Reporting Program (DARP), concluded that DF is the most appropriate and most effective treatment for youth among the major options available.

In an important paper on the "natural history of drug addiction," Vaillant (1970) summarized conclusions based on his and O'Donnell's (1969) long-term followup studies of former Lexington Hospital patients. Vaillant observed that although heroin addiction usually persists for more than a decade, most addicts spend at least part of that time abstinent. The evidence cited indicated that addicts rarely become voluntarily abstinent, by aging out or motivation for abstinence. More likely factors are loss of their source of supply, external coercion, or provision of a substitute for addiction, such as alcohol, religion, or formation of a close relationship with another person (e.g., wife, employer, etc.). In general this was supported by the conclusions of the major review by Gorsuch et al. (1976) and also those of a recent national conference (Rittenhouse 1976). This statement implies that treatment is a potential agent for achieving favorable change, but also that followup over a long period of time (perhaps 20 years) is desirable to measure treatment effects unambiguously. Vaillant concluded that the likelihood of achieving abstinence improves with time and estimated that 2 percent of addicts at risk (i.e., not incarcerated or confined) become abstinent every year. Without questioning the accuracy of this estimate, such a trend, as well as expected deaths, which range between 1 and 2 percent at risk per year, must be taken into account to avoid significant errors in the interpretation of followup

TABLE 1.—*Comparison of patient samples in four treatment modalities on demographic and baseline characteristics. Based on DARP research sample, Simpson et al. (1976)*

		Treatment Sample			
Variable	Measure	Methadone maintenance (MM)	Therapeutic community (TC)	Outpatient drug free (DF)	Detoxification (DT)
No. in Sample	N	11,023	4,505	5,785	6,147
Sex	Percent male	78%	74%	69%	76%
Age	Median age at admission	26.7 yrs	22.0 yrs.	20.0 yrs	24.7 yrs.
	Percent under 18	1%	15%	37%	4%
	Percent over 30	30%	12%	9%	22%
Ethnic Group	Black	58%	34%	26%	50%
	White	16%	51%	63%	31%
	Puerto Rican	15%	11%	5%	6%
	Mexican-American	10%	3%	5%	12%
Baseline Drug	Percent daily opioid use	94%	63%	35%	88%
	Percent nonopioid only	1%	17%	48%	7%
Baseline Alcohol Use	Percent over 8 oz. daily	14%	19%	15%	15%
Baseline Employment	Percent employment over 30 days per 2-month period	25%	16%	27%	28%
Baseline Productive Activities (Empl., School, or Home-making)	Percent engaged in productive activities	38%	35%	62%	30%
Criminality	Percent supported by legal activities	47%	54%	23%	64%

data. He also observed that addiction is highly dependent on the social setting, implying the importance of demographic, cultural, and economic factors as sources of variance that need to be accounted for in evaluation studies. Writing at the beginning of the present decade, Vaillant concluded that the traditional medical care model, the social casework-mobilization of family resources model, and the legal-correctional punishment model had all been unambiguous failures in the treatment of addiction. He speculated that the most attractive treatment paradigms, predictable from the natural history of addiction, were parole, methadone maintenance, and Synanon-like therapeutic communities. His argument was that all three depend on a backdrop of social prohibition and legal sanction against narcotic drug abuse and also on close and prolonged supervision in the community; in addition, all three provide some substitute for narcotics. Vaillant's analysis indicated that premorbid factors were also associated with favorable outcomes and that stable patterns of employment and low criminality prior to addiction are positive predictors.

A MODEL FOR EVALUATION OF TREATMENT EFFECTIVENESS

The multidimensional model outlined briefly here is described in detail in a recent publication by Sells et al. (1977b). It is assumed that the study of treatment effectiveness is a research task. The model involves a class of quasiexperimental analytic designs for multimodality treatment evaluation research, based on prospective, longitudinal tracking of patients from admission through treatment and subsequent followup after a posttreatment period of unsupervised community living. It involves measurement of changes on specific criteria, selected as relevant to the goals of specified treatments. The data points for measurement of change include a pretreatment baseline period, periodic intervals throughout treatment, and uniform periods following termination of treatment, adjusted for time when patients are confined or otherwise not at risk. An important feature of the model involves comparison of outcomes across treatments with statistical adjustments for a set of relevant (covariant) factors that are assumed to account for variance in the criterion measures, apart from the assumed effects of treatment. The covariates considered relevant include at least three subsets of variables: (a) demographic characteristics (age, race, and sex); (b) developmental background factors (e.g., criminality and drug use history, socioeconomic factors, school and employment history, and responsibility for family dependents, when applicable); and (c) prior treatment for substance abuse. These are considered relevant because they have been shown to result both in differential assignment to particular types of treatment and in differential prognosis for favorable change as an outcome of the reference treatment evaluated (Sells et al. 1977a).

Criterion Measures

It is important that the criterion variables employed to measure outcomes be related to treatment goals and that they be designed to be comparable over time at the various points at which they are reported. For publicly supported treatment a common set of conforming behavioral goals can reasonably be specified, despite differences in priority and degree of expected change that reflect long-standing differences in philosophy and policy among some authorities. The common goals include reduction (and in some statements, elimination) of substance use and associated criminality, and rehabilitative outcomes, especially employment or alternative productive role activities, such as school attendance or homemaking. The differences among treatment authorities in relation to outcome criteria involve mainly the relative importance of abstinence (in respect to drug use), return to maintenance treatment, and reduction of criminality, as opposed to other outcomes. These reflect varying conceptions of the purposes of treatment. There are those who view treatment mainly as a social control device to deal with "the drug problem" emphasizing demand reduction and reduction of criminality, and others who view treatment as primarily therapeutic and rehabilitative, to assist rejected, disadvantaged individuals in need of help to cope with frustration and stress (Sells 1977a). On the issue of abstinence, there is divided opinion and active research concerning whether abstinence is a feasible goal for all narcotic addicts. Dole and Nyswander (1976) have based their advocacy of indefinite maintenance at least in part on the belief that many long-term narcotic addicts are physiologically unable to detoxify; available evidence on this issue is reviewed below. The literature shows considerable variation on a number of other issues, such as the importance of including marihuana use in the definition of drug abstinence, the inclusion of alcohol use as a criterion for treatment of drug users, and in the definitions and construction of criterion measures.

Although the emphasis here is on behavioral criteria, some investigators have employed personality and other psychological measures, either separately or in addition to behavioral measures. For example, De Leon et al. (1973) administered scales measuring psychopathology and Russo (1971), self-concept scales, to residents of therapeutic communities. Such measures are costly to administer and score in large-scale studies and involve validity problems that undoubtedly restrict their use. However, they are of particular interest in therapeutic communities, as opposed to outpatient programs, since residents are usually not comparably at risk with respect to most behavioral measures while in treatment.

Specification of Treatment Paradigms

Most of the studies identified in the drug treatment evaluation literature fit the classification of program evaluation rather than of treatment evaluation. The former are typically concerned with a single unit or program and focus on evaluation data with only minimum explication of the treatment paradigms involved. As a result, idiosyncratic features are difficult to assess and the conclusions reached have restricted generalizability, even though they may be meaningful to the respective institutional constituencies. By contrast, treatment evaluation implies the analysis of data from multiple programs practicing comparable treatment paradigms, as essential for generalization of results.

Numerous treatment approaches have been tried in the United States. Among the more prominent of these are (1) maintenance on morphine or heroin—this was short lived although never appropriately evaluated; (2) hospitalization in abstinence-oriented, large regional hospitals, patterned along psychiatric lines and directed by psychiatrists, such as those at Lexington and Fort Worth—several studies are mentioned below for these facilities, which have generally been regarded as having had records of low treatment effectiveness; (3) civil commitment programs, e.g., the California Rehabilitation Center—a study of this program is discussed below; (4) treatment as part of a general service, such as a psychiatric clinic or hospital—little if any evaluation data are available for this category; (5) therapeutic communities in the Synanon-Daytop tradition—although no evaluation of earlier programs is known, more recent data on this treatment approach are included below; (6) inpatient, short-term detoxification—probably the most common "treatment" available to addicts, detoxification was used mainly as a means of reducing drug habits prior to return to street life and was not regarded as having lasting effects; and (7) halfway houses to assist addicts released from treatment or correctional institutions or on probation to return to community living—many of these programs included aftercare phases and a network of aftercare facilities was created under the NARA (Narcotic Addict Rehabilitation Act) Act of 1966.

With the advent of large-scale Federal funds in the late 1960s and the emphasis on community-based treatment in the wake of the Community Mental Health Act of 1963, four modalities or general classes of treatment evolved and became recognized. These include methadone maintenance (MM), therapeutic community programs (TC), outpatient drug-free programs (DF), and short-term detoxification (DT). Although admission data usually distinguished between "voluntary" or self-referred patients and those referred by courts, awaiting trial, or in other legal status, it is believed that some degree of overt or covert coercion is involved in virtually all drug treatment patients (Sells 1977a).

MM programs have generally been operated on an outpatient basis and involve substitution for street heroin of dependence on methadone, an addictive opioid but without the disturbing psychological effects of heroin. As demonstrated by Dole and Nyswander (1965), maintenance on methadone relieves the addicted person from dependence on the hazardous street life and, combined with a rehabilitation-oriented therapy program, enables him to return to conforming personal, family, and community living. Methadone has been and continues to be controlled by the Food and Drug Administration as an experimental drug, with research protocols required, and must be administered under medical supervision. Daily doses are necessary in most cases, and require daily clinic visits by patients unless take-home doses are permitted, as privileges. Average duration in treatment was around 15 months for DARP MM admissions between 1969 and 1973 (Simpson et al. 1976), although some patients have been maintained for considerably longer periods (up to and even exceeding 10 years). However, time in MM treatment declined over the three DARP admission cohorts and subsequent CODAP data have shown a further, sharp decline; whereas 59 percent of DARP MM patients admitted in 1969-1971 were still in treatment after 1 year, this figure dropped to 40 percent for the 1972-1973 cohort (Simpson et al. 1976) and the comparable figure for all CODAP MM patients in 1976 was 24 percent (CODAP 1976).

Therapeutic communities are typically full-time, drug-free, residential programs that emphasize patient-government and group pressures to persuade the individual of the childishness and ineptness of his previous behavior and of the inability of drugs to solve problems. A major goal is to socialize an individual to more adaptive beliefs and attitudes and to patterns of mature and productive behavior. The models for the TC have been based on the pioneer work of Maxwell Jones (1953) and were exemplified in such programs as Synanon, Daytop, Phoenix House, Odyssey House, and other private and semiprivate agencies for the rehabilitation of heroin addicts in a therapeutic community setting. Planned duration of TC treatment varies from short-term, 2-month programs to the more traditional TCs that take a year or longer. Time in treatment has declined in TCs, but a continuing problem has been the high rate of failure to complete the required curriculum.

DF programs are both outpatient and drug-free and have been offered mainly for nonopiate users. They vary widely in intended duration of treatment as well as in program goals, processes, and content. At one extreme are highly demanding, socialization-oriented programs operated as daytime TCs, and at the other extreme are relaxed programs that offer rap sessions, recreational activities, and help with problems on request. Retention of patients has been a problem in DF programs even more than in TCs.

DT programs are usually short-term, not over 21 days in all. Inpatient detoxification uses hospital beds and employs various medications to avoid undue discomfort to the patient during withdrawal. Although some programs provide a limited amount of counseling, the principal aim is necessarily the elimination of physiological dependence. Outpatient (ambulatory) detoxification of heroin addicts by gradually diminished doses of methadone was started experimentally during the early 1970s, when the increased demand for methadone maintenance resulted in waiting lists at numerous clinics. Although less rigorous and longer in duration than inpatient detoxification, it has appeal to certain groups of clients and has been continued as a treatment option. DT as a separate treatment, whether followed by other treatments or not, should be differentiated from detoxification introduced as a late phase in some MM treatments.

Within modalities considerable variation has been observed with respect to treatment goals, processes, staffing, facilities, demand on client time and effort, planned duration of treatment, discipline and use of sanctions, use of maintenance and other drugs for therapy, degree of responsibility allowed to patients in planning and determining their individual goals and treatment regimens, use of patient influence in treatment, and incorporation into the treatment program of ancillary rehabilitative services—such as vocational training, job placement, counseling and psychotherapy (individual and group), family counseling, educational programs, housing assistance, legal services, medical services, and recreational programs. Such variations have been illustrated in case studies presented by Glasscote et al. (1972), Brill and Lieberman (1972), and others. Only one program of taxonomic research designed to develop a systematic treatment typology has thus far been undertaken. This was part of the NIDA-TCU research program based on the Drug Abuse Reporting Program (DARP) and includes reports by Watson et al. (1974), Cole and Watterson (1976), James et al. (1976a,b), and James et al. (1975). In view of the overriding importance of specification of treatment in evaluation designs, this is a noteworthy landmark in treatment evaluation research.

SOME METHODOLOGICAL ISSUES

Problems of Comparison Across Treatments

In the evaluation model presented, outcome criteria are dependent on treatment goals. Thus treatment effectiveness is conceptualized not in absolute terms but as relative to the expressed goals and presumably the resources invested as well as the philosophical orientations related to the respective treatments. Although the major criterion variables cited as appropriate for publicly supported treatment are applicable to the four contemporary treatment modalities described (as well as to others mentioned earlier), it should not be expected that representative samples of patients in these modalities have comparable baseline scores on profiles of these measures. Indeed, as shown in table 1, they differ considerably, partly as a result of the respective specific treatment focuses and governing regulations (e.g., MM is applicable only for addicted opioid users) and partly because of the practical wisdom of the clinical judgments involved in treatment assignment. In view of differences of the magnitude shown—for example, the MM sample is predominantly male, older, black, and includes 94 percent daily opioid users at admission while the DF sample includes significantly more females, is considerably younger and predominantly white, and has only 35 percent daily opioid users—the interpretation of results on the several criteria will vary among treatments. In the example cited, changes on opioid use would be more important for MM patients than for DF patients; further, the level of pretreatment opioid use in MM, compared to DF, suggests that the MM programs faced a considerably more difficult task in relation to this criterion (and also criminality) than did the DF programs.

Evaluation During Treatment and Posttreatment

Evaluation of treatment is meaningful for the period that patients are in treatment and under the surveillance of the treatment agency (the During Treatment phase) as well as for periods after treatment, when they return to unsupervised community living (the Posttreatment phase). In many respects Posttreatment evaluation is the acid test of treatment effectiveness, although the time elapsed after treatment is a critical factor. However, During Treatment evaluation is important also, since as Sells et al. (1977a) have shown, most patients in most treatments manifest substantial and usually early improvement on most criteria (suggesting a compliance factor) and those who remain comparatively longer than average continue to improve over the time in treatment (suggesting in addition a therapeutic change factor). Since compliance during treatment is consistent with the social control goal mentioned earlier, it is a noteworthy result, apart from the question of the validity of the therapeutic change factor, which is subject to test in relation to posttreatment criteria. Compliance during treatment is so general that it merits consideration of treatment as a social control alternative to incarceration entirely apart from considerations of therapeutic change.

Base Periods for Measurement of Change

McGlothlin et al. (1977), in a followup study of the California Civil Addict Program, argued that since drug usage is usually abnormally high immediately before admission to treatment, "followup evaluations that utilize relatively short pretreatment baseline periods are likely to insure a substantial improvement in the postadmission behavior by virtue of this self-selection phenomenon." It should be noted that a short pretreatment period corresponds to the acute stage of the problem and generally determines the treatment strategy and immediate goals, while a longer period (e.g., a year) resembles the chronic state, but is not necessarily descriptive of the particular problems (e.g., drug use) leading to treatment. Both provide important but different information. The critical point is that neither is adequate alone as a standard against which to measure treatment-induced change. The acute measure may suggest greater change than the chronic measure and this should of course be understood. However, variations on the acute measure are necessary for covariate adjustment of baseline levels.

Validity of Interview Data

Some of the data required in evaluation such as drug and alcohol use and illegal activity can be collected practically only by interview with the persons involved. Others, such as employment, arrests and jail episodes, and other treatment, might be obtained from records or verified from records, except for the constraints imposed by procedures for the protection of individual privacy and anonymity. As a result, most of the data employed in evaluation studies have been obtained by interview and this raises questions concerning the credibility of such self-report information. This question has received attention from a number of investigators and the consensus of the studies reviewed is that although some systematic underreporting of deviance occurs, information obtained from drug users by trained interviewers is highly reliable and consistent with independent record sources. Simpson et al. (1976) reviewed this literature and contributed new confirmatory data from followup interviews in the DARP program.

Random Assignment of Patients to Treatment

By contrast to the refinements characteristic of well-designed laboratory experiments, field studies of drug users in treatment challenge the ingenuity of investigators to observe rigorous rules of scientific procedure. One issue on which field studies in this area have been criticized is that subjects have rarely been assigned to treatments by random procedures and that this calls the validity of many statistical comparisons into question. In addition, in the absence of random assignments, comparison groups composed of untreated controls are not possible. Investigators who are experienced in field research in the so-called "real world" and who must depend on the support and cooperation of administrative and clinical authorities to conduct their studies, see the problem in a different perspective. Statistical assumptions are indeed important, but the effective social scientist must employ (and if necessary develop) methods appropriate to his data, not adapt his data to traditional statistical methods. Random assignment might require patients to enroll in unwanted or less preferred treatments or conflict with eligibility requirements or clinical judgment and thus interfere with the treatment process and generate artificial or distorted data that misrepresent the treatment situation. The analytic model presented here implies the utilization of robust multivariate methods that can assess the effects of variations in patient demographic and background characteristics, prior treatment, and other factors that influence outcomes in addition to those attributable to treatment.

Other Issues

A general survey of methodological issues in treatment evaluation research is presented in the paper by Sells et al. (1977a).

EVALUATION RESULTS

This section summarizes results of evaluation studies of drug user treatment with emphasis on recent publications. Additional references can be found in the bibliographies of the studies cited or requested from the Drug Abuse Epidemiology Data Center at Texas Christian University.

Federal Narcotic Treatment Hospitals

Followup studies of opioid addicts treated at the Lexington Hospital have been published by Vaillant (1966a,b,c,d), O'Donnell (1969), and others, using different samples followed at different times. In general, relapse to narcotic use was observed for most discharged patients (over 90 percent) in the short term (6 months to 1 year after discharge), but abstinence rates were higher in the long term (e.g., at 5 years) and increased over time. However, the more favorable longer term results were not attributed to the hospital treatment, but to other factors, such as preaddiction employment and low preaddiction criminality, as well as environmental differences among the samples studied.

Detoxification from Methadone Maintenance

Dole (Dole and Joseph 1977) and others have advocated a policy of encouragement of addicts with "a many-year history of intractable heroin usage" to remain in (methadone maintenance) treatment. This is based, in part, on indications for a New York City sample of extremely favorable patient performance with respect to opiate use and criminality while in treatment as opposed to poor performance of discharged addicts, and in part, on disappointing followup results for the same sample in which the best results after detoxification (20 percent judged successful) were found for a subset of patients identified as addicted for a relatively short period prior to treatment, young, employed, responsible in behavior, stable in home situation, and not alcoholic. Dole attributed the low retention rates in MM programs and the closing of many treatment clinics to administrative policies of limiting treatment and discouraging reentry, which he considered "hard to defend in rational terms."

The detoxification of MM patients and postdetoxification outcomes of those who detoxify successfully has received serious research attention. Senay et al. (1977) addressed conditions of detoxification in a well-designed, controlled experiment. Based on dropout rates, illicit drug use, scores on symptom scales, and requests to interrupt the study, superior results were found in the groups that were carefully prepared for detoxification and withdrawn by gradual dose reduction (3 percent of initial dose per week as opposed to 10 percent in the rapid-reduction group).

Studies by Cushman (1974), Meznitz et al. (1974), and particularly by Stimmel et al. (1977) have contributed to the understanding of detoxification in MM treatment and of subsequent outcomes of detoxified MM patients. Although the results reported varied, reflecting different patient samples, sample sizes, procedures, and criterion definitions, they are in general agreement with the data presented by Dole (Dole and Joseph 1977) and also by Senay et al. (1977). The cumulative evidence of these studies indicated that detoxification is not at all an automatic process in MM, but also that of those who completed detoxification, as many as 35 percent were narcotic free and doing generally well up to 6 years thereafter (Stimmel et al. 1977). These investigators agree that while abstinence after narcotic dependency is possible, it is not a realistic goal for all. Duration in MM treatment and favorable staff evaluation of treatment progress (based on negative urines, insight concerning personal needs, concern with long-term goals, increased frustration tolerance, stable home life, improved interpersonal relations, meaningful use of time, and vocational stability) were associated with continued abstinence, while premature detoxification from MM resulted in high recidivism rates. The results with respect to time in treatment are well confirmed, but may require further study and redefinition in view of the progressive lowering of time spent in treatment.

California Civil Addict Program

This program, initiated in 1961, differs from the federally supported treatment programs in that it is operated under correctional auspices and involves supervision and control as well as treatment. (See description in Glasscote et al. 1972.) Involuntary commitment of addicts or suspected addicts convicted of felonies or misdemeanors is for 7 years, and voluntary commitment for 2½ years; all committed persons spend an initial period (presently the first 7 months) in the California Rehabilitation Center for therapy, schooling, and vocational training and then transfer to outpatient status under strict parole supervision. McGlothlin et al. (1977) interviewed 756 of a male sample of 949 former admissions 5 to 12 years after admission, and evaluated their time incarcerated and legal supervision, drug use and dealing, employment, and criminal activities when not incarcerated; they also computed a composite score (alive, not incarcerated, and not using narcotics daily). The sample included subgroups admitted at different time periods and under different degrees of supervision; the most recent (1970) group also had access to methadone maintenance.

The results were complex and were interpreted with careful attention to group differences. In general, those who continued in the program performed substantially better during the commitment period, involving strict supervision with urine testing, than did a comparable (matched) group discharged on a legal technicality shortly after admission. In other words, narcotic use and associated behaviors were reduced significantly in the supervised group during the commitment period. There were also some significant postdischarge results, but lesser in magnitude; however, those who were discharged as successful tended to do relatively well up to the time of interview. Finally, the availability of methadone maintenance to the subgroup under more lenient supervision was a significant factor in reduction of heroin use for that group. In agreement with other treatment evaluation studies, significant compliance with expected standards was observed during the period of commitment (i.e., during treatment) and those committees who performed well while in the program tended to continue to do so after discharge. Although the supervisory emphasis is a distinctive feature of this civil commitment approach, the role of methadone maintenance in conjunction with more lenient supervision is noteworthy.

Therapeutic Communities

Representative followup studies of TC samples have been reported by De Leon and Andrews (1977) on Phoenix House; Pin et al. (1976) on Horizon House; Romond et al. (1975) on the Daytop program in New Haven; Collier and Hijazi (1974) on the Daytop program in New York; Slotkin and Senay (1973) on Gateway House; and Barr et al. (1973) on the Eagleville Hospital. These differ in sample sizes and composition and in sophistication of methodology. the Phoenix and Horizon studies approach most closely the research model presented earlier. The Horizon data included both TC (60 percent) and DF (40 percent) patients and the Phoenix study concentrated on dropouts; the Daytop and Gateway studies compared graduates and dropouts, and the Eagleville study took into account participation in extended (outpatient) care after the residential phase. Cumulatively, these studies support the conclusion that TC treatment is effective. Most generally, good performance during treatment, graduation, and time in treatment were significant conditions of subsequent favorable performance with respect to drug use, criminality, and employment. For dropouts from Phoenix House, De Leon and Andrews reported that the greatest amount of change was observed 6 months after termination and the maximum reached at 36 months (in a 60-month followup), but the magnitude of improvement on every outcome variable was directly related to the time in program. Pin et al. (1976) noted further that the higher the pretreatment pathology (e.g., use of drugs by the family, amount spent per day for heroin, use of alcohol, number of arrests, low socioeconomic status) the poorer the posttreatment performance.

Halfway House

A well-designed study of the West Los Angeles Impact Drug Rehabilitation Center was reported by Katz et al. (1975). In addition to defining the treatment program, these investigators were innovative in utilizing probation officers and parole agents as "verifiers" to obtain informed, independent responses parallel to those obtained from the sample of 118 residents followed 4 to 18 months after leaving the Impact Center. Agreement between subjects and verifiers was high. It was found that overall 65-69 percent were employed for 17 to 19 weeks; 20 percent had been arrested, and although 51-60 percent had used drugs since leaving the Center, 8-16 percent were using at interview. Number of days in the program and attendance at Narcotics Anonymous meetings were significant predictors of length of employment, number of arrests, and drug use, after leaving the Center. Age at first drug use and number of pretreatment arrests also predicted posttreatment drug use. These results for a program involving strict legal supervision, and with a residential component patterned after the traditional TC, are similar to those obtained for therapeutic communities.

Detoxification Programs

Canada (1972) reported the results of a short-term (30-60 day) detoxification program in Seattle, using methadone for patients believed to be addicted to narcotics. Only 58 percent (157) of 270 patients were located in February and March 1971, 6 months after detoxification. Of these, 39.5 percent were using drugs regularly or occasionally, 5 percent were incarcerated, 43 percent were in treatment (41 percent in MM), and 13.5 percent were "clean." These results appear to be typical of short-term detoxification alone.

Multimodality Studies

Burt and Associates (1977) summarized the results of two retrospective followup studies in 1974-1975, one involving the Addiction Services Agency (ASA) in New York City by MACRO Systems, Inc., and the other, the Narcotics Treatment Administration (NTA) in Washington, D.C., by the Burt organization. The ASA sample included 782 admitted to MM, ambulatory TC (a form of DF), and residential TC treatment in 1971 at 14 New York City agencies. The NTA sample included 360 admitted in 1971, 1972, and 1973 to MM and detoxification-abstinence treatment. In both studies, the samples were drawn randomly from treatment rosters and used comparison groups of admitted patients who left treatment within 5 days. Drug use, employment status, and criminal activity were checked for the 2-month periods preceding admission, following termination, and preceding the followup interview. The ASA study was based on interviews with 59 percent of the sample and the NTA study, on 81 percent.

Both studies reported a high rate of favorable change on all criteria, and these changes were found "irrespective of the type of treatment initiated and, at least to some extent, irrespective of whether or not treatment was instituted." NTA clients in the "no treatment" comparison group fared as well as those in treatment and a similiar pattern was found for ASA, although clients in treatment over a full year had better employment records than others with less time in treatment. The ASA TC clients had slightly better posttreatment employment records, and as a result, more clients were classified as "fully recovered" than other groups. In general, the authors of this report concluded that, in NTA, MM patients did as well as those in DT and that, in ASA, no modality was clearly superior to the others. Furthermore, no relationships were found either between demographic or background factors and the posttreatment outcome measures.

These results are atypical in relation to most of those reviewed above. They may indeed reflect atypical treatment outcomes. However, a careful reading of the reports identified problems in the design and analysis of the data that may explain them. In particular, the outcome scores represented very brief time intervals (i.e., 2 months) and these were short in comparison with those employed in most studies; longer time periods would probably have yielded more reliable and somewhat different results. Further, although mention was made of the percentages of both samples that later reentered treatment, subsequent treatment was not taken into consideration in the evaluation. Differences in sample characterisitics were noted, at least for the ASA sample, but posttreatment outcome scores were not adjusted for them. Also, the posttreatment data were not adjusted for time at risk or compared for uniform periods after termination of treatment; the 2-month periods preceding the followup interview were used as a basis of comparison, but fell at different intervals of time after treatment.

The DARP Studies

The DARP program was established in 1968 as a patient reporting and tracking system to provide a data base for the evaluation of treatment by federally supported programs. Funding was provided by the National Institute of Mental Health and later by the National Institute on Drug Abuse. Data were collected on a total of approximately 44,000 admissions to 52 agencies throughout the United States and in Puerto Rico. Admissions were reported between June 1, 1969, and March 31, 1973, and bimonthly status evaluation reports up to termination from treatment (and for readmissions) were continued up to March 31, 1974 to insure tracking during treatment for all patients for at least 1 full year. Classification studies of patients, measures, and treatments and evaluation studies during treatment, implementing the research model presented here, have been published in five volumes (Sells 1974a,b, and Sells and Simpson 1976a,b,c). Post-DARP evaluation followup studies based on the full model have been completed for samples from the first two DARP admission cohorts (1969-1972) and the preparations for data collection on the third, 1972-1973, cohort sample were initiated in 1977. The cohort 1-2 followup samples were interviewed during 1975-1976.

The major results of the during-treatment evaluation studies were as follows.

1. As expected, there were substantial differences in the treatment population over time and also between the types of patients assigned to the various modalities. In 1971 new legislation enabled the inclusion in federally supported programs of drug dependent individuals other than opioid addicts. Subsequently the population shifted in the direction of increased proportions of females, youth, whites, and users of nonopioid drugs. This was correlated with a decrease in the proportion of DARP patients in MM and an increase in DF.

2. Planned as well as actual duration of TC and DF treatments became shorter over the years of the DARP. Although some practitioners of MM have continued to advocate indefinite maintenance, actual time in treatment decreased for annual admission cohorts in all treatments. For example, in MM, the percentages of the three cohorts that remained in treatment 6 months or less were 23, 28, and 37 percent, respectively, and the corresponding percentages that remained over 12 months were 59, 50, and 40 percent.

3. MM had the longest tenure in treatment. For example, the median time in treatment for the DARP research sample was over 12 months for MM, over 3 but less than 4 for TC and DF, less than ½ month for inpatient DT, and between 1 and 2 months for outpatient DT. TC and DF had significantly more patients terminated as completed (graduated) than MM. The most frequent category of termination—in all treatments—was quit. This was highest in outpatient DT, but also very high in TC and DF. In all treatments length of stay and favorableness of termination (completed and referred versus other categories) correlated significantly with the quality of behavioral outcomes. In general, those who remained longer and were discharged

as completed or referred for other treatment had *superior outcomes compared to short-term dropouts.*

4. Generally favorable during-treatment performance was observed for most groups in all treatments. Favorable outcomes were correlated with age (older), ethnic group (white), and with favorable background (e.g., low criminality) and baseline levels on the criteria, except in MM where most patients showed significant decreases in drug use and criminality.

5. Early favorable reports on most criteria (on the first status evaluation report) suggested the existence of a compliance factor, reflecting the response to coercive entry and program surveillance on during-treatment outcomes. However, continued improvement over time, particularly in MM, suggested a therapeutic change factor, as well; this was not related to baseline differences. It should be noted that during-treatment evaluation of behavioral outcomes for TC and inpatient DT was limited because residential and hospitalized patients were minimally at risk during treatment.

The first, preliminary results of the DARP followup study (Sells et al. 1976) were reminiscent of those reported by Burt and Associates (1977) cited above: ". . . while the groups in the two major modalities, MM and TC, had clearly superior outcomes to the DT-OP (outpatient detoxification) and NT (also referred to as IO, a no-treatment comparison group that went through intake only and then left) groups on most comparisons, the DT and NT patients had higher rates of return to treatment and also sufficiently favorable outcomes to suggest that they too showed impressive changes" (p. 554). However, after adjusting the post-DARP data for time at risk, and adjusting for pre-DARP population differences by covariance analysis, in accordance with the research model, Simpson et al. (1977) showed clearly that significant favorable post-DARP outcomes on drug use (opioid use and nonopioid use), legitimate employment, and criminality were achieved in MM and TC treatments, and in DF (except for criminality), but not in DT or IO. These results were based on a subset of 2,178 black and white males (extracted for analysis from the full sample of 3,131 patients) who were represented in the 5 treatment groups compared. They are relevant to the basic question of treatment effectiveness and to comparison among the treatments, but were not used to estimate degrees of effectiveness in the treatment samples studied.

These questions were addressed in a companion study by Demaree and several associates (Hornick et al. 1977) who computed composite post-DARP outcome scores, based on the first principal component of a six-variable profile (employment, opioid use, nonopioid use, alcohol use, criminality, and return to treatment), and clustered the total followup sample into 11 outcome groups with discrete profiles ordered by the composite scores and representing different patterns and degrees of favorable to unfavorable outcome over the first 3 years after DARP. Detailed explication of these data for the five treatment groups included (MM, TC, DF, DT, and IO) is included in the Hornick et al. (1977) report and was summarized by Sells (1977b) and by Sells et al. (1977a).

With reference to comparison of treatments it must be recognized that the composite scores and outcome group profiles gave major weight to opioid use and criminality and are therefore more appropriate for MM, TC, DT, and IO than for DF, in which the predominant drug use pattern involves nonopioid drugs, often in conjunction with less than daily or occasional use of opioids. Further, the ideology of many MM programs would consider continuation in treatment and moderate drug and alcohol use by employed, noncriminal individuals as acceptable (rejection of such behavior being regarded as moralistic), while the ideology of most TC programs strongly favors abstinence and regards return to treatment as a negative outcome (as it appeared to be in the DARP analyses).

With these qualifications, the outcomes for MM, TC, and DF appeared most favorable, while those for DT and IO were significantly lower. In the three top outcome groups with generally successful profiles the percentages were 30 percent, 37 percent and 34 percent, respectively, for MM, TC, and DF, compared to 20 percent and 21 percent, for DT and IO; comparable figures for the three lowest (unsuccessful) groups were 14 percent, 16 percent, and 15 percent for MM, TC, and DF and 26 percent and 25 percent for DT and IO. When these percentages were compared with expected percentages based on predictions by factors that discriminated the outcome groups in multiple discriminant analyses, it was found further that the MM and TC outcomes exceeded expectation in the favorable direction, DF did more poorly than expected, and DT and IO fell far below expectation. For example, in the black and white male subsample, the actual and expected percentages for the five treatment groups in the highest outcome range were:

	MM	TC	DF	DT	IO
Actual percentage	30	37	34	20	21
Expected percentage	27	31	49	31	26
Number in group	773	613	241	153	143

The high expected percentage for DF reflects the composition of the DF sample and the gap between the actual and expected percentages for this treatment group suggests that DF was relatively ineffective for the patients assigned. On the other hand, a study of DARP youth aged 19 and below indicated that DF outcomes exceeded those in the other treatments for that age range (Sells and Simpson 1977).

In the DARP followup studies cited it was found, in agreement with other studies reviewed, that time in treatment, type of termination (principally completed-graduated vs. quit), and performance during treatment (compliance and low social deviance based on opioid use, employment, and criminality) in MM, TC, and DF were significantly correlated with post-DARP performance for the first 3 years, even when corrected for the effects of all pre-DARP factors. Even though the evidence presented is highly indicative of treatment effectiveness, however, other factors, particularly high background and baseline criminality and opioid use, and associated low social responsibility and socioeconomic status, were also independently related to post-DARP outcomes.

CONCLUDING COMMENT

The evidence reviewed can be regarded as providing a strong basis for acceptance of the effectiveness of a number of treatment approaches for drug abusers. The correctional civil commitment program in California, methadone maintenance, and the therapeutic community appear to have demonstrated worth for narcotic addicts, while outpatient drug-free programs appear effective mainly for youthful nonopioid and polydrug users. Although strict supervision and control were presented as features of the California program, it is important to understand that the drug use involved here is illegal and the other treatments have involved court referral, plea bargaining, and many forms of indirect coercion in recruitment and management of their patients. Detoxification as an entry procedure for drug-free treatment or as a means of recruitment to treatment may well be justified, but the evidence reviewed does not justify consideration of detoxification as an effective independent treatment.

Although the DARP data in particular link posttreatment measures with participation in treatment, especially in the comparison of actual and expected outcomes, they do not link outcomes with treatment process. Further research should represent significant aspects of treatment process in the analytic model along with measures of program capability and level of treatment "dosage" as distinguished from merely time in treatment, which is both an outcome during treatment and a strong predictor of posttreatment performance. Data are available on treatment process and on community context variables (which have been shown by Singh et al. [1976] and Joe et al. [1977] to be significantly related to during treatment outcomes) for the DARP sample and investigations along these lines are currently in progress.

During the decade that drug use has been a problem in the United States, the dimensions of the problem have been in almost constant flux. The DARP program represents the only large-scale multitreatment data base for treatment evaluation available, and it represents admissions between 1969 and 1973. Since 1973, changes have occurred, such as population shift and reduction of time in treatment, that DARP cannot address. Further, the full cycle of a prospective study of suitable size, including followup for at least 3 years, requires about 7 years; by this time the problem may again be quite different. The only solution appears to be a continuing, large-scale evaluation effort, with proper attention to the diverse methodological nuances alluded to in this paper and the supporting references.

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treatment methods for specific needs

This section is more diverse than the previous section. It contains two chapters on treatment on both alcohol and drug abuse, and two on the application of services well established for other clients to the needs of drug abusers—aftercare and vocational rehabilitation. Three chapters address the treatment problems of specific groups—women, polydrug users, criminal justice clients—and some of the efforts that have been made to improve treatment for these groups. Stanton's chapter reviews attempts to apply to drug treatment the family approach that has been more widely used in other fields, and O'Brien and Ng review several experimental treatment methods.

McGlothlin's chapter on criminal justice clients directly addresses one of the major concerns of the Task Panel on Psychoactive Drug Use/Misuse of the President's Commission on Mental Health —what they perceive as conflict between the purposes and goals of the treatment system and the criminal justice system. But McGlothlin finds that empirically, voluntary admission and coercion are not polar opposites as the Panel seems to assume; some "voluntary" patients are admitted under pressure, though not legal pressure, and some probationers and parolees enter treatment against, rather than because of, the wishes of their supervising officers. In the abstract, the argument against coercing users into treatment is a strong one; McGlothlin recognizes this, and even accepts it, to some extent. But his chapter shows how the shift from an abstract to an empirical level makes an issue more complicated but more meaningful.

The variety of treatment methods, and of techniques to handle specific problems that arise, are reasonably well covered in the second and third sections, though treatment personnel will also find information useful in treatment in later sections. This variety in itself reflects the fact that present treatment methods are not satisfactory, and that new or improved methods must be found.

As most of the authors indicate, this will require research to establish that the methods do indeed work. Because each author has been restricted to a specific field, two aspects of the needed research may not have been sufficiently emphasized. One is the desirability of comparisons between methods, which poses the problem discussed in the introduction to the second section, and in Sells' chapter on treatment effectiveness, finding a common measure of outcome which is equally appropriate to two or more methods. More thinking about this is needed.

The second is a need which has been recognized by clinicians for many years but on which little progress has been made. That is to establish for what types of patients, and under what conditions, the different treatment methods are most effective.

10. Women in Treatment

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INTRODUCTION

Psychotropic drug use, misuse, and abuse of substances including narcotics, depressants, stimulants, hallucinogens (including cannabis), and alcohol have become a burgeoning problem in the United States over the past decade. Although narcotic abuse, particularly of heroin, initially appeared to be the greatest problem, we are currently aware of large numbers of emotionally distraught individuals who are in need of psychotropic medications which are procured through licit as well as illicit sources. Of great concern is the fact that one in four narcotic addicts and one in two alcoholics and barbiturate users are women. The vast majority of women who abuse drugs are of childbearing age (between 15 and 40 years of age), and the implications are profound. It appears drug abuse has increased and had an effect not only on this generation of adult women, but also on future generations to which they give birth. Unfortunately, a general complacency exists with regard to licit psychotropic medications and the extent of drug use during pregnancy, with its concomitant effects on the fetus and neonate. Nevertheless, the prevalence and sequelae of both licit and illicit psychotropic drug use in women in general, as well as those who are pregnant, indicate that the phenomenon represents a significant problem which must be recognized and addressed by health care delivery systems which attempt to provide optimal medical, psychological, and social care.

Extensive information is available in the literature in regard to both research and clinical experiences, indicating that illicit drug abuse by women leads to problems in female physiological functioning, poor pregnancy outcomes, and inadequacies in fulfilling the parental role. Initially, it was thought that, compared to men, only a few women were addicted, and that few women actually entered available treatment facilities; therefore, types of treatments available for women and issues of effective treatment have not been addressed or examined. Women were described as more pathological, more self-destructive, and harder to work with than men. Unfortunately, these views resulted from anecdotal information or clinical impressions often based on very few cases which were fraught with cultural bias and poor methodology. Only recently have persistent questions been raised about sex-related measurement biases or methodological problems and research designs, the persuasiveness of male-oriented program philosophies and treatment methods, the dynamics within treatment programs as they affect women, and the development of appropriate treatment and post-treatment methods, interventions, and goals for women.

This paper will review the recent trends of drug use, misuse, and abuse by women in the United States, the prevalence of various kinds of drug use/abuse in women, and the negative consequences in terms of health and social well-being. In addition, views of the medical community concerning needs of women drug abusers in regard to identification, rehabilitation, education, and treatment issues will be considered. The paper is based on a review of current manuscripts in the literature, as well as several large reports recently prepared for the National Institute on Drug Abuse by the Women's Drug Research Coordinating Project of the Wayne County Department of Substance Abuse Services and the University of Michigan; Burt Associates, Incorporated in Bethesda, Maryland; and a manual, recently published for medical professionals and paraprofessionals, addressing the issues of drug dependence in pregnancy and methods of management of the mother and child. In addition, research data from this author's program have been included.

PREVALENCE OF PSYCHOTROPIC DRUG USE AMONG WOMEN

The prevalence of psychotropic drug use among women has always been higher than among men, approximately two times more for each class of psychotropic drug and for any given psychotropic agent. Cooperstock (1971) has described a model of sex differences in mood-modifying drug use for a nonhospitalized population. The drugs selected for study were psychotropic agents that included antidepressant drugs, both major and minor tranquilizers, respiratory and cerebral stimulants, sedatives, and hypnotic drugs — primarily barbiturates. Narcotics were not included. The increased incidence of drug use by women in this model has been ascribed to the following factors. (1) Society permits women greater freedom than men in expressing feelings. (2) Women are more likely than men to perceive emotional problems in themselves. Men define their problems in functional rather than emotional terms, for example, work-related difficulties, sleep difficulties. (3) Women are more likely than men to bring their emotional difficulties to the attention of the physician, whether a general practitioner or a psychiatrist. (4) Physicians, as members of the larger society, expect women to be more expressive in their behavior. (5) Physicians would expect women to need mood-modifying drugs to a greater extent than men. Other views include the fact that currently there are excessive demands on female social roles, and that women use alternative substances, such as alcohol, less than men in coping with emotional stress.

As reported by Finnegan (1978), a study of regular users of nonopiate drugs, excluding marihuana, conducted by the New York State Drug Abuse Control Commission in 1970 revealed. (1) Those using legal drugs obtained without legal prescriptions were approximately 10 times as numerous as those using licit narcotics. (2) About 45 percent of the nonopiate users were less than 35 years of age, with women comprising 60 to 65 percent of the entire nonopiate-using population.

The majority of women abusing drugs are of childbearing age and although data concerning the effects of pharmacologic agents administered during pregnancy have been available for a long time, the seriousness of their significance in the obstetrical patient does not appear to be fully appreciated. Despite recent advances in the area of fetal and neonatal pharmacology, many physicians continue to prescribe drugs to the pregnant woman without considering the potential untoward effects upon the fetus. Also, with the increase of narcotic addiction in the United States over the past decade, the country has been plagued with the resultant birth of a large number of infants who have been exposed to the prenatal stress of illicit drug usage.

In addition to physician-prescribed drugs and those utilized by the drug-dependent individual, the vast majority of pharmacologic agents used in pregnancy are those that are self-prescribed by the obstetrical patient. A retrospective review of 911 randomly selected mothers found that 82 percent of the women had been taking prescribed medications during pregnancy, excluding iron supplements. The average number of prescribed drugs per woman was four, with additional self-medication reported by 65 percent of the women. The most frequent reason for drug consumption was the relief of anxiety or analgesia (Forfar and Nelson 1973).

Increasing attention is being focused upon infants born to narcotic-dependent mothers, with specific emphasis being placed upon women maintained on methadone. This concern is appropriate in view of the large number of persons currently enrolled in methadone programs in the United States. The literature reporting the effects of methadone on the neonate has been quite controversial, showing considerable disagreement among various investigators. The scope of difference is wide, stemming from statements that methadone is relatively innocuous to the neonate, to those stating that methadone causes serious abstinence symptoms and an increasing incidence of sudden infant death syndrome. Unfortunately, accurate conclusions from these studies are extremely difficult to make due to the small, poorly delineated populations utilized and the absence of adequate control groups. Furthermore, there is a need to delineate and define the effects of continued multiple drug abuse with methadone maintenance, as compared to controlled methadone maintenance in conjunction with psychosocial and medical support.

Over the last few years multiple drug use has become more frequent, especially of those agents in the alcohol-tranquilizing groups in combination with other drugs. Statistics obtained from the Drug Abuse Warning Network, established by the Drug Enforcement Agency and the National Institute on Drug Abuse, indicate a current increase in drug abuse in women, and, moreover, there is evidence that it unfortunately has spread into the adolescent years.

UNIQUENESS OF DRUG-ABUSING WOMEN IN COMPARISON TO DRUG-ABUSING MEN

Most of the published information available on heroin addiction describes male addicts. The special problems of female addicts have been given relatively little attention over the years, and this fact may account for the common assertion that women are considerably less amenable to treatment than men. It is of great concern to those in the drug abuse field that there is a need for increased knowledge and understanding of female drug abusers. With this increased knowledge and understanding, there should be a positive impact on the treatment available to them.

Eldred and Washington (1975) developed a profile of female addicts upon admission to a city-run treatment program in Washington, D.C., and compared them to their male cohort. They were likely to be unemployed and receiving no financial assistance; to have children who may or may not be living with them; to be currently unmarried, to want no more children in the immediate future, yet to fail to practice contraception consistently. The women were responsible for significantly more children than the men, so that efforts toward rehabilitation were complex as they strove to meet the needs of their children while attempting to achieve economic self-sufficiency and give up drugs. The parent role requires a considerable investment of psychic energy plus the practical component of actual time and energy in child care responsibilities at a time when the woman's own self-development may require maximum concentration.

The Women's Drug Research Project (WDR) (Reed et al. 1977) has systematically explored the psychiatric and social-problem approaches to understanding female addiction. Due to a confluence of health, economic, social, and psychological factors as described thus far, addicted women, when compared to their nonaddicted counterparts, appeared to be lower in self-esteem, higher in reported symptoms of depression and anxiety, more open to the development of relationships, lower in masculinity and femininity, and higher in assertiveness. These factors may, in fact, be assets in treatment situations, since these women may be more open to drastic change given the proper combination of facilities, program design, and staff attitudes.

A summary of observations of female drug use by Suffet and Brotman (1976) reveals that for purposes of coping with stress, men tend to use alcohol; women tend to use pills. Females are more likely than males to have first tried heroin for relief of personal disturbances. Females are also more likely than males to give this as reason for failure of the first attempt at withdrawal. Among regular users of illegal drugs, a large proportion are males; among regular users of psychotherapeutics, the larger proportion are females. In general, maladjustments to sex-role norms and expectations show a higher association with subsequent drug dependence among women than among men. Differences in patterns of substance abuse among men and women seem to center around the higher prevalence of abuse of sedatives, hypnotics, barbiturates, or amphetamines among women.

It appears probable that the use of recreational drugs by women will increase, assuming that this type of drug use is closely tied to a more liberated lifestyle. It is reasonable to predict that as women assert their right to greater freedom in their private lives, a larger proportion of them will use marihuana and other drugs. As women rebel against the double standards which deny them certain personal freedoms granted to men, a greater parity in rates of male and female drug use, especially among teenagers and young adults, should be seen. If women achieve social equality and alleviate the strains associated with their sex role, the rate of pill use may decrease. As women gain equality in occupational situations, they may be subject to the same pressures now experienced by men in regard to career mobility, job responsibilities, dislocations, and uncertainties in the employment market. Having attained the same job satisfactions and similar tensions and anxieties, women may change from their psychotropic pill use to a predominant pattern of alcohol use, as is seen in men.

Aside from social and psychological uniqueness of the female, one should consider the pharmacologic aspects when comparing drug abuse in men and women. While females generally respond to drugs in a manner similar to males, there are important differences which are only beginning to be understood. Studies in animals have shown that females metabolize some drugs more slowly than males, and thus exhibit more intense and longer-lasting effects than males; this gender difference does not appear to be important in humans, primarily because other individual differences in rates of drug metabolism obscure the sex-related effect (Finnegan 1978). Pregnancy, though, involves many physiologic changes, including an increase in renal function and changes in blood flow to various organs. There is increasing evidence that drug elimination is altered during pregnancy, but there is no general trend in this effect. Consequently, the development of pregnancy in women being treated with drugs requires a close evaluation of the appropriateness of a given drug and the dosage regimen. In addition to the potential congenital abnormalities associated with drug ingestion throughout pregnancy, there are the potential effects on the subsequent development of the infant in its postnatal behavioral and intellectual performance (Kron et al. 1976; Strauss et al. 1976).

When considering the effects of drugs on the fetus, one must consider the transplacental passage. This becomes critical in the case of psychoactive drug use. It is a commonly held misconception that the placenta protects the fetus from maternally ingested drugs by preventing their transport to the fetus. Any drug which has psychopharmacologic effects will easily cross the placenta. Repeated use of a psychoactive drug by a pregnant woman will result in accumulation of that drug in the fetus to levels that are at least as high as those achieved in the mother and may cause fetal toxicity.

In regard to fetal toxicity, the type and severity of adverse effects of a given drug on the fetus depend on a multitude of factors, including the size and frequency of the dose, the route of administration, the state of pregnancy, maternal health and nutritional status, genetic makeup of the mother and fetus, previous obstetrical history, and a myriad of environmental factors, including concomitant exposure to other drugs, smoking status, and perhaps even environmental pollutants. These factors are important throughout pregnancy, for even after the completion of organ and skeletal development, when the fetus is no longer susceptible to gross anatomical defects, it remains vulnerable to growth retardation and a variety of functional and behavioral abnormalities.

There is some concern that either continuous or intermittent use of depressant drugs may be associated with mental deficiency in the infant. While there is little direct evidence for this, it is known that prolonged cessation of breathing in the first few minutes after delivery is associated with behavioral problems and intellectual deficiencies, a relationship which causes obstetricians to be conservative with the use of depressants in the perinatal period. The opioid drugs are depressants of breathing in infants as well as in adults, and morphine appears to be particularly effective in depressing breathing in the neonate. A possible explanation for this is that the newborn has an immature blood-brain barrier for drugs, which later matures to impede the passage of water-soluble drugs into the brain. Thus, when morphine, a relatively water-soluble opioid, is given to a mother, it will achieve a higher level in the fetal brain than in the maternal brain. This differential brain permeability appears to be less important for more fat soluble opioids such as meperidine hydrochloride and methadone. The fact that infants of mothers who are chronic users of narcotics do not have an unusually high incidence of respiratory depression at birth is probably related to the development of tolerance in the drug-dependent fetus.

The distribution and effects of diazepam in the maternal-fetal unit and neonate have been studied in women who were given this drug during pregnancy for a variety of indications, and who were neither dependent upon narcotics nor abusing other drugs. Diazepam transfers across the placenta both in early and late pregnancy and accumulates in fetal tissues in high enough concentrations to sustain pharmacological action for at least 8 to 10 days after birth. Symptoms in the neonate as a result of passive abstinence may include lethargy, respiratory difficulties including apneic spells, disturbances in thermoregulation, hypotonia, and failure to suck effectively (Finnegan 1978; Kron et al. 1976).

Studies of the effects of barbiturates on the human maternal-fetal unit and neonate have similarly shown that infants born of mothers receiving chronic barbiturate treatment or abusing barbiturates during pregnancy may have perinatal symptoms of withdrawal.

Alcohol abuse is a major problem both in heroin addicts and methadone maintenance patients, and alcoholics commonly abuse other drugs. Alcoholic beverages contain many chemicals (congeners and aldehydes) in addition to ethanol. Little is known about the disposition of alcohol in the human maternal-fetal unit or about the possibility of more subtle effects of chronic alcohol abuse on the fetus and neonate. Some infants born to women who are heavy drinkers have been described as having a pattern of abnormal features termed the "fetal alcohol syndrome" (Jones and Smith 1975). This syndrome consists of abnormalities of the face, microcephaly, low I.Q., and prenatal and postnatal growth retardation. While these deviations would not generally be considered under the category of congenital defects, they are nevertheless suggestive of adverse fetal outcome in pregnant alcoholics and prompt concern for other covert abnormalities.

Smoking is almost universal among heroin addicts and methadone maintenance patients. Several studies have suggested that chronic smoking is associated with intrauterine growth retardation (Davies et al. 1976; Miller et al. 1976).

In addition to heroin, methadone, barbiturates, and diazepam, those drugs that have been reported to cause abstinence in newborns include: pentazocine hydrochloride, ethchlorvynol, chlordiazepoxide, imipramine, diphenhydramine hydrochloride, and propoxyphene hydrochloride. The benefits of the drug which is given to the pregnant female must be carefully weighed before the fetus is subjected to the many risks encountered with pharmacologic agents. In the case of the pregnant woman who uses illicit drugs, her situation, as well as that of the unborn fetus, can pose overwhelming problems which must be dealt with in order to provide an improved outcome for both mother and child (Finnegan 1976).

RECOMMENDATIONS FOR THE MEDICAL AND PSYCHOSOCIAL MANAGEMENT OF DRUG-ABUSING WOMEN

Drug abuse programs are typically evaluated by their success in decreasing illegal drug-taking behavior, decreasing criminality, and increasing social productivity. The Women's Drug Research Coordinating Project (Reed et al. 1977) has taken the position that the definition of social productivity, the process of addiction, and the social roles and relationships that can either support or inhibit change efforts are all different for men and women. Women must learn to handle those factors that predispose them to an addiction career and supported escalation of it. They must examine the social forces that help maintain the addiction and learn to strengthen those that support terminating it, and they must develop a viable alternative career for themselves and be prepared to handle the continued stigma of being an ex-addict. The WDR Project has summarized the differences that are likely to exist between men and women addicts, and the tasks and issues they pose for intervention programs concerned about women. The following have been proposed:

1. Women are socialized differently. In general, women have fewer skills in, and less comfort with, anger, competition, and aggression. Their self-esteem and identity derive more from others' perceptions of them (especially males'). As a result they are more aware of, and sensitive to, interpersonal cues and relationships, and more likely to need and use a support network of relationships.

2. Women's status in this society is generally derived from men. Usually, actual material and financial support, and physical protection are dependent on men. The woman addict is often introduced to drugs by a man, uses drugs with men, and supports her drug habit in partnership with a man. Relationships with other women are less valued and often competitive in nature.

3. Women who commit deviant behaviors are more socially stigmatized than men. Since sex-role identity is a key to a person's identity, the woman involved in a deviant career may experience significant conflict in her definition of femininity as a result of this deviance. She is also likely to experience considerably more negative reactions and rejections as a result of her deviant behavior, and to the degree that she has internalized society's view of her behavior, may experience considerably lower levels of self-esteem than the addicted male.

4. Women are expected to play more key family roles. In addition to whatever marketplace role the woman may choose to assume, she is still expected to place equal (or more important) emphasis on family roles — homemaking, childrearing, etc.

5. Women typically are given most responsibility for birth control and parenthood. They must bear the child when birth control is not practiced or fails, and are seen as more responsible for caretaking and for any problems with the child after it arrives.

6. Women have more medical problems, and are perceived differently when they complain about these problems. Because of the many medical problems seen in women, it is important to have special services for them, especially in the area of gynecological problems and dental care. The special needs of pregnant women will be described in subsequent sections.

7. Women have fewer and less lucrative vocational options than men and often more family responsibilities that make giving up some of the benefits of public assistance impossible or very difficult.

8. Women are differentially perceived and responded to by the criminal justice system. They may be arrested and convicted less often, but are more often psychologically harassed and have fewer treatment and rehabilitation options once arrested.

9. Women addicts have often been sexually abused. Even those who have not chosen to support their habits by prostitution have often suffered considerable sexual and physical abuse.

Suggestions by the WDR Project (Reed et al. 1977) used by some programs in trying to develop better services for their women include:

1. Programs to identify and work on sexism in female and male clients and staff. The way staff members behave toward each other will have im-

portant ramifications in how clients view acceptable male-female interaction.

2. Programs to develop new intervention techniques that build on women's strengths and give them new skills and special supports in areas of conflict. These techniques may include assertiveness training, behavioral modifications, and special issue-oriented groups.

3. Programs to recognize the nature of the women's relationship with the man in her life, and if it is destructive, help her change it or find alternatives. Concurrently, programs need to help women develop relationships with other women and recognize their commonalities with other women. To accomplish these things, women's groups and development of family-oriented intervention are among the alternatives.

4. Programs to develop and provide special education and training programs in areas of jobs, birth control and family planning, health and hygiene, and nutrition.

5. Programs to provide necessary and usually omitted services for women. Provision of child-care facilities would make treatment services more accessible. Training in child development and effective parenting would increase confidence. Also, programs need to provide active advocacy in developing alternative jobs for their clients. Another key area is health. Women are too often dependent on impersonal health systems for treatment and have too little knowledge about their own bodies or how to receive effective services.

6. Programs to assist women in meeting basic survival needs. Especially if a woman must break some of her basic dependency relationships in order to give up her addiction career, she may be in dire need of a wide variety of services to assist in obtaining food, clothing, lodging, minimal medical care, keeping out of jail, refraining from abusing a child, etc. Many of these needs do not need intrapsychic intervention, but require basic skill training in where resources are in this society and how to get them.

7. Programs that do not ignore the addiction. Ironically, programs that have been most concerned about the roles and problems of women have tended to be less concerned about what makes these women different the addiction. While many programs focus too much on the drug, addiction is a very real physiological and psychological process. The woman must learn about the effects of the drug on her body, the forces that began and supported her drug use, and the difficulties of giving up the drug and finding alternatives.

8. Programs that periodically examine their own environment, structure, and procedures to be sure they are not inhibiting the very changes they are trying to promote. This can be a very subtle process, and the use of outside consultation is recommended, especially during any major transitions.

An additional view is presented by Santo (1977) in a comparison of substance abuse by men and women at the Polydrug Research Center of the Philadelphia Psychiatric Center. The major diagnostic implication of his study was that the genesis and maintenance of drug abuse behavior in the female is intricately related to the family process. His study has shown the importance of the family of origin as the prime socializing agency. Families use medicine at home, often indiscriminately, sometimes destructively. The educational impact of the family's use of the home medicine cabinet is an issue that needs greater emphasis in the planning of drug education programs in the schools. These programs have been concerned almost exclusively with those patterns of drug use which are transmitted in peer group interaction, and have neglected problematic behaviors which evolve within the family.

Various systems of family and marital therapy have focused on the influence of family dynamics on individual behavior. The findings of Santo suggest that this is of particular importance to the women, in that therapeutic intervention in these modes might prove more effective in changing drug abuse behavior than the traditional intrapsychically oriented methods of treatment. Group therapy with women is another treatment approach whose relevance in this regard has not been sufficiently investigated.

Features of a program for "client-mothers" might include halfway houses where female clients and their children could, for a time, live apart from other heroin users with whom they may be intimately involved while they gain the strength to return to their old environment or seek a new one. Such a facility might also provide a setting where mothers could receive instruction and practice in physical and behavioral aspects of child care and learn the skills necessary for caring for themselves in their homes, such as nutrition, budgeting, and simple home repairs. They might also be helped in exploring their feelings about having additional children, so that future parenthood would be based on choice rather than chance. Clients should be made aware of the possible negative effects of heroin or methadone use during pregnancy, and pregnant clients should be provided with the psychological support to get through their pregnancies with a minimum of drug use (Eldred et al. 1974).

It should be stressed that programs for addicted parents should include fathers as well as mothers, if they express an interest. Greater participation in family life and increased responsibility for their children may be regarded as rehabilitative goals for all addicted parents.

THE EFFECTS OF DRUG ABUSE ON THE HEALTH OF WOMEN

In addition to the economic, social, and psychological stresses of drug addiction, the female addict generally has poor health, for in her pursuit to obtain drugs, she neglects her health and her nutrition. Health conditions which would normally be minor in nonaddicted individuals are often not treated in the addicted woman, and therefore progress to major life-threatening conditions. One of the most frequent problems is the presence of gynecological infections, frequently caused by venereal diseases, such as condyloma acuminatum, gonorrhea, herpes progenitalis, and syphilis. Hepatitis accounts for another 4 percent of the infections found in the female addict and is generally Type B due to transmission of infection through the parenteral route. The use of unsterile needles, which are sometimes shared among friends, makes this population extremely vulnerable to this complication. The incidence of tetanus resulting from the repeated injection of drugs subcutaneously (skin-popping) is twice as common in female addicts as in nonaddicted females, and death rates are high.

Sixty to ninety percent of women dependent upon heroin have menstrual abnormalities, with amenorrhea the most frequently reported. Polydrug abuse may also accentuate menstrual irregularities. Other contributory factors found frequently in the narcotic addict are malnutrition, hepatitis, pelvic infection, and other physical illnesses, as well as the stress of the unstable social, economic, emotional environment in which the woman is involved. Dysmenorrhea (menstrual cramps) is increased during addiction and withdrawal. The cause may be secondary to pelvic infection. Amphetamines have been shown to cause an increased frequency of uterine irritability, resulting in dysmenorrhea and premature labor.

Women taking legally prescribed narcotics for underlying medical conditions and those enrolled in methadone maintenance programs usually do not have difficulty with their menstrual cycles. Similarly, discontinuation of illicit heroin with subsequent abstinence is associated with menstrual regularity in 57 to 88 percent of women. Eighty to ninety-three percent of women on chronic high-dose methadone maintenance treatment have reported a return of normal menstrual cycles during the first 6 to 12 months of treatment. In a few patients, up to 2 years were required for menses to return to normal. During methadone maintenance treatment, contraception therefore becomes necessary to avoid unwanted pregnancies, and when a pregnancy is desired, it seems to be feasible in patients whose menstrual cycles have returned to normal (Finnegan 1978).

Fertility is difficult to assess in any population and especially in heroin addicts, since proper prospective studies cannot be carried out. Since sexual activity has been reported to be very high, it is the impression of many observers that fertility is diminished. Studies have shown that 61 percent of active heroin users were infertile, based on the fact that of 100 former heroin addicts interviewed, all of whom had frequent sexual exposure without contraceptives while addicted to heroin, only 39 became pregnant for a total of 77 pregnancies while using heroin. The remaining 61 women never became pregnant while using heroin. The incidence of infertility is estimated to be around 13 percent in nonaddicted women (Finnegan 1978).

It must be emphasized, however, that although anovulatory cycles are frequent, if appropriate precautions are not taken, pregnancy may indeed occur. Studies in various cities have reported addicted women to comprise approximately 1 out of 12 deliveries. The need for family planning and dissemination of birth control information is therefore apparent.

Once a narcotic addict becomes pregnant, the course of the pregnancy may not be smooth. Increasing numbers of pregnant addicts have presented themselves to medical facilities, but the exact magnitude of narcotic dependency in pregnancy is difficult to determine because statistics are generally based only on women who come to hospitals or clinics for delivery. However, it is suspected that a considerable number of pregnant addicts may self-deliver or may be delivered at home without a physician in attendance. The majority of addicted women do not seek prenatal care, and therefore, nearly 70 percent arrive in the hospital after the onset of labor, having had no medical care during pregnancy. Therefore, clinical management of these patients is difficult because of obstetrical and medical complications which generally result from their tendencies to neglect general health care and to avoid seeking prenatal care throughout pregnancy. Obstetrical complications associated with heroin addiction include spontaneous abortion, abruptio placenta, amnionitis, breech presentation, emergency Cesarean section for fetal distress, chorioamnionitis, preeclampsia, eclampsia, intrauterine death, gestational diabetes, placental insufficiency, postpartum hemorrhage, premature labor, premature rupture of the membranes, and septic thrombophlebitis. During the postpartum period, withdrawal symptoms are hard to differentiate from endometritis (Finnegan and MacNew 1974). Social and emotional problems, such as poor housing, inadequate income, lack of education, and feelings of worthlessness and depression, add to the overall difficulties presented to the pregnant addict.

One cannot discuss the effects of drug abuse on the health of women without describing the medical problems of their offspring. It has already been described that these women tend to have an increased incidence of premature labor and, therefore, the birth of an extremely small infant. The incidence of low birth weight in infants of nontreated heroin-addicted women approaches 50 percent, in comparison to the national incidence which is between 8 and 10 percent. The concomitant increase in morbidity and mortality among these premature infants results in increased incidences of respiratory distress syndrome, asphyxia neonatorum, meconium aspiration, intracranial hemorrhage, hypoglycemia, hypocalcemia, hyperbilirubinemia, anemia, and infection. The majority of deaths among newborn infants, as well as an increased incidence of cerebral palsy, mental deficiency, lethal malformations, emotional disturbances, social maladjustments, and visual and hearing deficits, are associated with low birth weight (Finnegan 1976).

In addition to having an increased incidence of premature birth, these women have a greater chance of having intrauterine fetal growth retardation. Their infants, who are undergrown for gestational age, have an increased incidence of asphyxia, aspiration pneumonia, hypocalcemia, and hypoglycemia; about one-third of these have postnatal growth retardation and neurological sequelae (Finnegan 1976).

Some programs have been able to improve the outcome for infants born to drug-abusing mothers (Strauss et al. 1974; Connaughton et al. 1977; Finnegan et al. 1977a). In Philadelphia, a study of three groups of drug-abusing mothers has shown that with the use of methadone maintenance and comprehensive care, the outcome for the infant can be improved (Connaughton et al. 1977). Two groups of methadone-maintained mothers, one with inadequate and the other with adequate prenatal care, were compared to heroin-dependent women with no care.

These results demonstrated that maintenance of a drug-dependent woman on methadone under close supervision, with adequate prenatal care, is compatible with an uneventful pregnancy and birth of a healthy infant whose withdrawal symptoms in the neonatal period are readily controllable. The objective of methadone administration during pregnancy should not be to prevent withdrawal in the newborn; but rather, to decrease the incidence of maternal and fetal complications occurring during illicit heroin use. The duration of methadone maintenance should reflect the patient's own desires as well as consideration of her drug addiction history.

In summary, when a woman uses illicit drugs, the incidence of medical and social problems is extremely high. Many of the medical illnesses can either become chronic or life-threatening due to the lack of attention to them at their onset. When a woman becomes pregnant and uses illicit drugs, the situation for her as well as the unborn fetus can be overwhelming for the clinician. If he is aware of the numerous medical and obstetrical complications seen in these women, as well as the untoward effects expected in the newborn, the problem can be dealt with so that some of the effects of the prenatal stresses encountered when illicit drugs are used can be altered. This is, of course, only if the woman presents herself to a medical facility early in pregnancy (Finnegan 1976).

RECOMMENDATIONS FOR PREGNANT DRUG-ABUSING WOMEN

The pregnant woman who abuses drugs must be designated as high-risk and warrants specialized care, including addictive and obstetrical management, and psychosocial counselling. The following recommendations have been suggested in several sources (Connaughton et al. 1977; Finnegan 1975; Finnegan et al. 1977b).

1. Addictive care may involve voluntary drug-free therapeutic communities, methadone detoxification, or methadone maintenance. Various advantages and disadvantages have been described in regard to some of these options. Although admission to a methadone maintenance program requires initial hospitalization for substitution of the heroin habit by methadone, the patient can be stabilized on a daily controlled

dose of the drug. Advantages include (a) better participation in prenatal care; (b) shorter hospital stay for the newborn; (c) improved attention by the mother to her health care needs and those of her child; (d) creation of a more stable social environment for both the mother and the infant; and (e) the ability to follow these mothers and infants on a long-term basis in order to evaluate outcome.

It should be made clear that methadone was never described as a panacea, since the only claim that had been made originally was that this chemical agent could relieve the compulsive drive for illicit narcotics in the addicted individual. In addition, it should be remembered that in order to give the addict hope and self-respect, human warmth is required. For her to become a productive citizen, she needs the effective support of persons who can help her find a job and protect her from discrimination. The use of methadone, therefore, can only be an adjunct in what should be a comprehensive approach to the treatment of addiction. Fortunately for the pregnant, opiate-dependent woman, the majority of programs in recent years have used methadone only in this fashion, which probably accounts for the successes found in these programs.

Therefore, the pregnant, drug-dependent woman should be evaluated in a hospital setting where a complete history and physical examination may be accomplished and certain laboratory tests carried out to evaluate her overall health status. When appropriate, low-dose methadone maintenance with substantial medical and paramedical support should be instituted. Detoxification, if requested or necessary, should take place preferably between the 14th to the 28th week of gestation and should be accomplished very slowly (for example, 5 mg reductions every 2 weeks). The pregnant woman addicted to barbiturates or major tranquilizers along with opiates should be detoxified during her second trimester in a very specialized detoxification center.

2. Because of the prenatal medical and obstetrical complications inherent in drug-abusing mothers, it is important to consider the infants born to these women as high-risk. They should be admitted to an intensive care nursery where they are carefully observed, and where personnel make use of an abstinence scoring system so that infants may be treated appropriately. Mothers should be permitted to visit their newborns frequently in the neonatal nurseries and be able to hold and feed them, even if they are undergoing abstinence and being treated. All program staff should be involved in encouraging maternal-infant attachment, not only prenatally, but in the immediate postpartum period. In the prenatal period, educational classes should be held to discuss the care of the newborn, as well as relevant behaviors that the mother will observe (Finnegan et al. 1975).

3. Psychological counselling should be given by an experienced social worker who is aware of the medical needs as well as the social and psychological needs of this population.

4. Social and medical support should not end in the hospital setting, but an outreach program incorporating public health nurses and community workers should be established.

5. The mother's parenting skills should be assessed so that one can ascertain her ability to care for the infant after discharge from the hospital.

6. Mechanisms by which to follow and supervise the infant's course after discharge from the hospital should be established. It is extremely important to have public health nurses and community workers go into the home to assist the mother in the care of the infant, as well as to pick up beginning signs of child abuse or neglect.

RESEARCH IMPLICATIONS

It appears obvious from the multiple problems seen in drug-abusing women in regard to their medical and social needs, as well as specific treatment goals for their addiction, that research in this area is truly in its infancy. Basic research in the areas of prevention, identification, rehabilitation, and treatment, as well as education in regard to drug-abusing women in general, as well as those that are pregnant, is badly needed. The research should include excellent methodology, with appropriate control groups, but exclude value-based interpretations and small or nonrepresentative samples. When sex differences are studied, one should not discount race and socioeconomic class. Longitudinal analysis could be performed to examine the experiences of socially supported and socially isolated women in treatment. Comparisons should be made between supportive and nonsupportive treatment environments to examine the experiences of women in supportive versus nonsupportive treatment centers. Model programs such as those designed by the Women's Drug Research Project and those specializing in the pregnant drug-abusing woman should be developed in various cities, not only so that treatment needs of women may be met, but in order to study the effectiveness and the long-term outcome of such specifically designed programs for women.

There is an urgent need for the collection of systematic data on issues concerning pregnancy and addiction. It is important to identify and obtain the cooperation of several programs that treat pregnant addicts in order to develop a consistent data collection form and further evaluate the effect of comprehensive care on the pregnancy, as well as on the neonate and child. The data should be collected and analyzed to determine the relationships among the wide range of variables of interests and outcomes for the mother and the child.

The following research questions could be addressed through pilot projects or groups of projects with special service emphases (Sowder 1977):

1. Do children who experience early extended contact with their addicted mothers during the neonatal period, and whose families are provided comprehensive followup services in their formative years, show less developmental problems than their peers who do not receive these services?

2. Is the provision of parent education to drug-abusing parents soon after the child's birth and throughout early childhood related to positive cognitive and social development among their children?

3. If children of drug-abusing parents are enrolled in enriched preschool programs, do they show greater cognitive gains and better socioemotional adjustment than matched peers who have not been enrolled in these programs?

4. Do children who are abused or neglected by their drug-abusing parents show "normal" development if placed from early infancy for adoption or in stable foster care?

5. Do older children of drug-abusing parents who receive services within a coordinated network of community agencies (providing for medical, social, educational, nutritional, and other needs) have less social, psychological, behavioral, and learning disabilities than their same-age peers who live with drug-abusing parents who do not receive these services?

The above questions contain many complexities that would require carefully designed studies (including well-matched control groups). Ideally, the research would be longitudinal; data collected periodically could provide program planners with useful interim data which could assist them in planning resource allocations for future efforts. In the interim, too, many children and parents would be provided needed services.

Additional suggestions for further research in regard to pregnant addicts include:

1. Study the effects of heroin and methadone use on the pregnant addict's lifestyle, and collect socially and medically related data.

2. Investigate new treatment modalities for the drug-dependent mother to include the safety of the various methadone maintenance dosage regimens for the fetus.

3. Study the dietary habits and nutritional status of the pregnant addict and compare results with control groups of nonaddicted parents.

4. Further justify the therapeutic modalities currently being utilized for the neonate undergoing abstinence.

5. Evaluate mothering practices of women who have abused drugs during pregnancy to assess their ability to carry on an effective childrearing role.

6. Develop outreach mechanisms so that more mothers and infants may be assessed in followup. This should provide a large enough experimental population for appropriate statistical analysis as well as comparable control populations.

Lastly, in view of the potential impact of female addiction on succeeding generations, coupled with the possibility of a rise in the incidence of female addiction, the inclusion of female addicts in research should no longer be considered an expendable luxury—rather, female addicts should be included in all studies of addiction in sufficient numbers to permit inferences about them. Such a step should preclude the necessity for future studies directed primarily toward an examination of sex differences or toward study of the unique characteristics, needs, and problems of the female addict client.

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11. Family Treatment of Drug Problems: A Review[1]

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Recent years have seen increasing interest in the role of the family in the genesis, maintenance, and treatment of drug misuse and dependence. Thinking in the drug field has broadened to include viewing substance abuse within its interpersonal context, i.e., relative to the other people involved, such as family and peers. To date at least four overviews of the family and drug abuse literature (Harbin and Maziar 1975; Klagsbrun and Davis 1977; Seldin 1972; Stanton 1979) and over 370 related publications (Stanton 1978a) have emerged. However, no review has been published on the various forms of family treatment which have been applied to drug problems or, where applicable, their results. This chapter will attempt to fill that void.

In contrast to the alcoholism field, which has used family and marital treatments for years and found them effective (Janzen 1977; Keller 1974; Steinglass 1976), family approaches are relatively new in the drug abuse field. It was not until the late 1960s and, more commonly, the early 1970s, that a number of drug treatment facilities across the country began applying family techniques with their clients. This led, eventually, to a Family and Drug Abuse Symposium which was held in Columbia, Maryland in 1975[2] and attended by 34 researchers, National Institute on Drug Abuse (NIDA) staff members, and representatives from 17 clinical programs which had been performing family treatment and research with drug abusers (Kupetz et al. 1977). A major upshot of the symposium was the launching of a survey to ascertain the extent to which family treatment approaches were being employed within drug programs across the United States.

The survey was completed 18 months later and the results were reported by S. B. Coleman (1976) and D. Davis (Coleman and Davis 1978). Of the 2,012 programs which responded (a 63 percent return rate), the investigators and symposium participants were surprised to find that 93 percent were providing family services or family treatment for at least a portion of their clients; 69 percent specifically noted that they provided family therapy which included the drug abuser. When asked whether family treatment was important for the addict's recovery process, the following responses were given: 74.2 percent highly important, 21.1 percent moderately important, 1.9 percent minimally important, and 0.1 percent not necessary. Seventy-five percent of the facilities which had family programs tended to see both the drug abuser and his family together, while marital therapy was the second most common approach. Behavioral and learning theories were considered useful and family tasks and role playing were frequently applied. The three family theoretician/practitioners who were most influential were, as ranked, Virginia Satir, Jay Haley, and Salvador Minuchin. In sum, the results indicated that the majority of our nation's drug programs employ some kind of family services—in many cases, family therapy—as part of their therapeutic armamentarium. A number of them also appear to have some knowledge of the techniques and theories prevalent in the overall field of family treatment. It seems that, like some of the rapid changes in drug use patterns that have at times unexpectedly swept the country, family treatment had "snuck" into the drug treatment arena to an extent unbeknownst even to those who supposedly had a finger on its pulse.

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[1] Portions of this review were included in a report entitled Drug Misuse and the Family, which was prepared for the White House Office of Drug Abuse Policy, Washington, D.C., in October 1977.

[2] This symposium was sponsored by the Center for Family Research and the Department of Psychiatry and Behavioral Sciences and George Washington University and was funded by the National Institute on Drug Abuse.

FAMILY PATTERNS AND STRUCTURES

It is not the purpose here to discuss the extensive body of demographic, psychosocial, and interactional literature which has accumulated on the families of drug abusers. This has been done in the four aforementioned reviews. Instead, a brief overview will be given of the predominant patterns and structures which have emerged from the body of existent research. Emphasis will be placed on findings with families in which a member shows heavy, compulsive drug use rather than occasional or experimental use.

Drug misuse appears initially to be an adolescent phenomenon. It is tied to the normal but often troublesome process of growing up, experimenting with new behaviors, becoming self-assertive, developing close (usually heterosexual) relationships with people outside the family, and leaving home. Kandel et al. (1976), extrapolating from Kandel's (1973, 1974, 1975) earlier data, propose that there are three stages in adolescent drug use and each has different concomitants. The first is the use of legal drugs, such as alcohol, and is mainly a social phenomenon. The second involves use of marihuana and is also primarily peer influenced. The third stage, frequent use of other illegal drugs, appears contingent more on the quality of the parent-adolescent relationship than on other factors. Thus, it is concluded that more serious drug misuse is predominantly a family phenomenon.

The importance of adolescence in the misuse of drugs becomes more apparent when family structure is considered. The prototypic drug-abuser family—as described in most of the literature—is one in which one parent is intensely involved with the abuser, while the other is more punitive, distant, and/or absent. Usually the overinvolved, indulgent, overprotective parent is of the opposite sex (although Alexander and Dibb [1975] posit that a same-sex parent may assume this role in some middle-class families). Sometimes this overinvolvement even reaches the point of incest (Cuskey 1977; Ellinwood et al. 1966; Wellisch et al. 1970). Further, the abusing offspring may serve a function for the parents, often as a channel for their communication. Consequently, the onset of adolescence, with its threat of losing the adolescent to outsiders, heralds parental panic. The family then becomes stuck at this developmental stage and a chronic, repetitive process sets in, centered on the individuation, growing up, and leaving of the "identified" patient (Alexander and Dibb 1975; Huberty 1975; Noone and Reddig 1976; Reilly 1976). The use of drugs is a paradoxical solution to the dilemma of staying or leaving, for it allows a certain level of competence (e.g., hustling) within a framework of incompetence, i.e., it is pseudo individuation (Stanton et al. 1978). It is also consonant with the frequent substance abuse which parents in many of these families show. In addition, much as the behavior of the young schizophrenic keeps his family together by giving them a problem to focus on and thus avoid parental dissension or separation, the use of drugs can have adaptive consequences (Davis et al. 1974; Haley 1973). This can extend even into adulthood, and there is evidence that a majority of drug addicts maintain close family ties up to age 30 and, in many cases, beyond (Ellinwood et al. 1966; Goldstein et al. 1977; Noone and Reddig 1976; Stanton 1978d; Stanton et al. 1978; Vaillant 1966). The major exception to these kinds of patterns has been described by Pittel et al. (1971) with middle-class, Haight-Ashbury psychedelic drug users, in which results indicated that the parents encouraged high achievement and independence in their offspring; other studies of families of middle-class youth who used nonpsychedelic drugs heavily are more consonant with the prototypic pattern.

The above description is necessarily brief. To be sure, there are variations on, and exceptions to, the theme. The reader is, again, referred to either the major literature reviews or the primary sources for additional information.

APPROACHES TO TREATMENT: TECHNIQUE AND OUTCOME

It is beyond the scope of this chapter to describe specifically "what goes on" in family treatment. There are dozens of books and hundreds of articles on the subject. For the reader interested in acquiring greater familiarity with family therapy techniques, per se, the reviews by Olson (1970), Shapiro (1978), and Stanton (1978c), or several of the existent compendia (e.g., Guerin 1976; Haley 1971) are suitable for starters.

Borrowing from Coleman (1976), we will define family treatment here as therapy or counseling of family members where a leader (therapist/counselor) helps a family to solve their problems and to achieve more positive and constructive ways of relating to one another. The composition of the group of members attending a session may vary according to the therapist's choice, experience, or "school," and may also vary from session to session for the same therapist. The general practice is to have more than one member present in a given session, whether it be a marital couple, a father-son dyad, or whatever. A cornerstone of the whole approach is that whatever the particular techniques employed, a whole family *system* is being addressed, rather than a group of separate individuals; the whole equals more than the sum of its parts, and includes the members *plus their interactions* (Olson 1970). Grasp of this concept is essential in understanding the content and thrust of the remainder of this chapter.

Before specifically discussing treatment, the reader might want to consider the various functions that drugs can serve within a family, especially if taken regularly or compulsively (Stanton 1978b). For instance, do they help to maintain the family's dynamic equilibrium, its homeostasis? Do they help in the labeling of a member as helpless and incompetent and, therefore, unable to leave home? Finally, do they serve as a problem which unifies the family and keeps it intact, much as a catastrophe unites people who experience it together?

Other considerations are also important. It is almost universally accepted by those who have studied compulsive drug use in families that the drug taking of one member is often overlooked by relatives; it may even be either openly or covertly encouraged (Harbin and Maziar 1975; Klagsbrun and Davis 1977; Mason 1958; Seldin 1972; Stanton 1979; Wellisch and Kaufman 1975; Wolk and Diskind 1961). Further, not only can the drug-taking pattern be supported and maintained by the system, but the family may actually work to sabotage those treatment efforts which begin to succeed in reducing or eliminating it. Examples of this have been commonly reported in the literature, such as the wife of the recovering alcoholic who buys him a bottle of liquor for his birthday, or the parent of the heroin addict who gives him money to purchase drugs. Hejinian and Pittel (1978) give data indicating that while addicts' spouse-type partners generally voice strong support for the abuser's abstinence, there is also evidence for an unconscious collusion with the addict to remain addicted. Such factors should not be forgotten when considering family treatment issues.

On the other hand, family involvement can prove beneficial (Dell Orto 1974). The inherent leverage of significant others can be used to help the drug-abusing member *overcome* his problem, rather than serving as a force which *maintains* it. To this point, Eldred and Washington (1976) found in interviews with 158 male and female heroin addicts that the people the patients thought would be most helpful to them in their attempts to give up drugs were the members of their families-of-origin or their in-laws; second and third choices were an opposite sex partner and the patient himself or herself. Further, Levy (1972) indicated in a 5-year followup of narcotic addicts that patients who successfully overcame drug abuse most often had family support.

In the following pages a number of different approaches to family treatment for drug abuse will be discussed. The purpose is to give the reader some idea as to what has been tried and with whom. Being a relatively new field—despite its apparent ubiquity—most of the work is exploratory. Unfortunately, however, in only a minority of the published articles has an attempt been made to assess effectiveness. Of the 56 applicable papers, all provide information on therapy technique, but only 26 make even the slightest mention of the efficacy of their treatment. Only four (Hendricks 1971; Stanton 1978d; Wunderlich et al. 1974; Ziegler-Driscoll 1977) provide comparative data, either with other forms of treatment or with control groups. The discussion to follow will present outcome data for the studies which did obtain it.

The material presented under the various headings below is not always as discrete as it appears. All of the described programs deal with drug abuse, and some utilize several concurrent techniques, such as combinations of family therapy and parents' groups (i.e., overlap is not uncommon). Categorization as it is used here is not meant to imply that a unimodal family approach is always preferable.

Marital Treatment

The earliest report on marital treatment for drug addiction was a single case report by Thorne in 1967; 20 sessions were involved, and the patient had been drug-free for 4 months before dying suddenly. In another case report, Spark and Papp (1970) worked with a couple in which the wife was addicted to amphetamines; after 6 months of treatment, the authors reported that both spouses had improved considerably across a number of different areas of functioning. One of the more important efforts in this area has been the work of Wellisch et al. (1970) with Haight-Ashbury couples. They described how each member competed in trying to enlist the therapist on his or her side against the other partner. Noted also was how the couples had to confront the reality that their relationship may have been predicated on heroin use; if one or the other decided to "kick" the habit, they had to decide whether enough of a bond remained to continue together. This is corroborated by the findings of (a) Africano et al. (1973) that marital unions formed during drug addiction would be more likely to dissolve after methadone treatment than those initiated at some other time, and (b) Clark et al. (1972) that non-addicted wives found their husbands' methadone program to be more satisfactory than did addicted wives.

Although his paper was presented much later, Gasta (Gasta and Schut 1977) was one of the first to treat couples within a methadone program. Among other things, he has emphasized the almost insurmountable difficulty of this work unless the therapist has a major (preferably primary) input into the monitoring and maintenance of medications.

Polakow and Doctor (1973) applied behavioral contingency contracting in a single case of a marital couple who abused barbiturates. A 1-year followup showed continued employment, improvement in the marriage relationship, and no return to drug use.

A preventive approach was taken in a program by Silver et al. (1975) for pregnant addicts. This was a comprehensive methadone program for the women and their addicted spouses, and the goals were to bring stability to the life situation and help the couples to become better parents. Instruction in prenatal and postnatal care was given, along with family and group treatment. Eighty-one percent completed the program. Outcome for 147 female patients indicated that 6 percent were drug free upon admission, 40 percent became drug free in treatment, 10 percent were detoxifying, and 44 percent were on methadone—three-quarters of them on a dosage of less than 40 mg. At admission, 10 percent of the husbands were employed, and this was increased to 55 percent by time of discharge. Comparisons with other treatment groups were not made.

Group Marital Treatment for Parents

Several programs have dealt in groups with individuals and marital couples who are parents of drug abusers. Often the content is of an educational nature. In the first paper on this approach, Hirsch (1961) described a group of five parents in which the participants resisted being labeled patients themselves and preferred to regard the group as a class or lecture program from which they could obtain advice. Ganger and Shugart (1966) met with two groups of addicts' mothers, but did not present their techniques. Dell Orto and Zibbell (1974) discussed the advantages of a parents' group convened as part of a residential treatment program. Tec (1972) took advantage of the preference for educational material by orienting parents' groups toward the teaching of better parent-adolescent communications. Huberty and Huberty (1976) have taken this a step further by consciously trying to make the parents' group into a recreational or "fun" experience; although marital problems of adolescent drug abusers' parents were dealt with at length, the authors felt that the tone of the groups helped to minimize dropout rates. Finally, Ziegler-Driscoll (1977) noted that in "relatives" groups composed mostly of parents, cohesion developed, and eventually the parents kept in touch outside the group and helped each other through crises. The groups also shifted from an emphasis on problems of their addicted offspring to parental conflicts.

Concurrent Parent and Identified Patient Treatment

In this approach, the members of the family may not be seen together, but meet concurrently within the same setting. The first published report of this approach was by Mason (1958), who tried, with only marginal success, to get addicts' mothers to engage in parents' group therapy; in the cases where this did happen, he reported that it did make the treatment process a bit more favorable. Vaglum (1973) reported on a successful case of a 19-year-old youth in which this technique was used. Amendolara (1974) described how a mothers' group for suburban drug-using youth evolved into a large parents group; she felt it was helpful and essential for treatment success. Caroff et al. (1970) and Gottesfeld et al. (1972), in working privately with intact families with a drug-abusing adolescent, felt that active involvement of parents (seen together as a couple) was necessary for reduction of drug taking. Kovacs (1975) also noted the futility of working alone with an adolescent drug user unless the parents were also involved.

A variation on this theme was introduced by Gottschalk et al. (1970), in that the services were performed under the auspices of a school system. Upper-middle-class parents and drug-using youths met separately for 45 minutes and then combined for the remaining 15-30 minutes. Goals were short term and a certain amount of the material was educational. Questionnaires were obtained from 29 participants (17 parents, 12 youths). Of the parents, 82 percent felt that the program had met their needs, that they would recommend it to others, and that they wished to continue. For the youths, 58 percent felt it was useful and wished to continue; 92 percent would recommend it to other families.

There are several reports of applications of this approach within residential settings. A program described by Ziegler-Driscoll (1977) included a process whereby identified patients were admitted to a therapeutic community with group and other therapies, while (in some cases) their families engaged in relatives' groups. Bratter (1974) reported on a concurrent parents' group in which the therapist played a supportive and consulting role in helping parents formulate a consistent, logical, sequential plan of action which was behaviorally or task-oriented; however, Bratter feels that, contrary to most thinking in the family field, in this approach the therapist's ultimate obligation is to the adolescent. In a description of a residential program with a parent-couples group led by Pauline Kaufmann, Bartlett (1975) noted that, while helpful, it functioned at a disadvantage because it was adjunctive and not integrated into the overall adolescents' program. Nonetheless, of the seven patients whose parents were involved, a 1-year followup showed five to be totally drug free.

An effort was made to control for outcome results in a study by Wunderlich et al. (1974). Short-term (12+ weeks) group therapy was provided separately for adolescent drug abusers and their parents. The prime function was to improve communication between parents and youth. The cases were court referred. A control group was designated of randomly chosen nondrug juvenile cases, from the same court, which were referred to other agencies for treatment. Results showed that the drug group tended to stay in school longer, had dramatically lower recidivism rates for arrests, and generally showed less social maladjustment than the nondrug group. While the control group was not a perfect match for the drug group (i.e., they were younger, and a better method would have been to obtain controls from among similar drug-using cases), this study is a credible attempt to isolate treatment effects and document the extent of influence of a particular approach to family treatment.

Treatment with Individual Families

This is the most common approach to family treatment and the greater portion of the relevant literature pertains to it. However, there are a number of subsets, not only as to inpatient versus outpatient origin, but also in the theoretical underpinnings involved and the specific techniques employed.

Inpatient-oriented treatment. A case of a 10-year-old hard drug abuser and his drug-using family has been presented in detail by Del Castillo and Gralnick (1971). Treatment also included group therapy and the overall outcome was reported to be quite positive. Wellisch and Hays (1973) describe five families of drug-using adolescents who were involved in family therapy along with inpatient group therapy. Although outcome data are not given, the authors consider this combined program to have proved beneficial to its clients. Twelve adolescent polydrug users and their familes were treated by Kempler and MacKenna (1975); while changes were observed in all the families, about half of them were considered to be clearly improved. Fram and Hoffman (1973) discuss a number of adolescent cases, most of which received family treatment as part of an inpatient program. While they do not discuss technique at any length, they also feel family treatment can be helpful. In addition, they state that 3 to 5 years of long-term therapy are needed to effect the necessary change, a time-span that is rather long and not in accordance with the views of most others working in the field.

Family therapy was an integral part of a 3-day hospitalization crisis intervention program conducted by Weisman et al. (1969). Family members were seen within 24 hours of hospitalization and family treatment was initiated prior to discharge. A number of the cases had substance abuse problems and most were from the lower socioeconomic classes. Although outcome data were not given specifically for drug cases, comparison of a group of 100 patients from the total patient population with other studies indicated that chances for rehospitalization were reduced, and at a notable saving in treatment costs.

Huberty (1975) has been more explicit than most in describing his approach to treatment, much of which has taken place in an inpatient setting with adolescents and their families. He sees drug misuse as serving a homeostatic function within a family, with members having an investment in keeping it as part of their pattern. While symptom oriented, he feels the actual problem is a family one and he endeavors to change the family pattern of interrelating. At times this requires removing the drug abuser to a residential facility. His approach is to help the family recognize the mutuality of their problems and accept each other as individuals, partly through identifying and clarifying family rules and communication patterns.

In one of the few studies with outcome data, Hagglund and Pylkkanen (1974) obtained followup information on 25 drug-using adolescents after discharge from an inpatient unit. Family therapy had been used concurrently with group and individual treatment. In the initial stage of treatment, most family aggression was directed toward the identified patient. As therapy progressed and the adolescent began to reduce drug taking, the family shifted their aggression to other objects. At followup, 56 percent of the patients felt that they had become more balanced and that their relationship with the environment had improved. Family members and official authorities had noticed the same change in 48 percent. Employment had been obtained by 64 percent of them; 60 percent had stopped using drugs, and 12 percent had decreased drug use. Lack of control or comparison groups dictates that these findings be considered promising but tentative.

Because of the fame of some of its clients, "familization" therapy (Catanzaro 1973; Catanzaro et al. 1973) has received a certain amount of publicity in recent years. Although originally a residential program for alcoholics, drug addicts and others have also been treated in some numbers. It utilizes many therapeutic community techniques but aims particularly at making a person a "responsible, caring member of a patient-family unit." After a period of treatment, members of a patient's natural family are admitted for several weeks as copatients, with the idea that the identified patient can transfer the newly learned skills to the usual home relationships. Although "dramatic and lasting" results have been claimed for many patients who had not shown improvement with other methods, to this author's knowledge the data from a projected 2-year followup have not yet been published.

Outpatient-oriented treatment. Many different approaches have been used in the outpatient treatment of drug abusers' families. Frederiksen et al. (1976) used contingency contracting to modify the relationship between an adolescent polydrug abuser and his family; both improvement in the family relationship and a marked decrease in drug use were noted. Wieland et al. (1975) describe a citywide system of "Family Mediation Centers" which provide short-term, crisis-oriented services to (primarily) families of polydrug abusers; techniques include improvement in communication skills, family negotiations, establishing achievable goals, etc. Staff estimates of the number of cases which show at least partial resolution of the presenting problem vary from 65 percent to 95 percent. Panio (1976) has presented a "problem-centered" model for family treatment with addicts. He discusses techniques for identifying and assessing family problems, with an eye toward changing maladaptive problemsolving patterns within a cotherapy setting.

At least five papers have presented a psychodynamic view of family treatment with drug abusers. Jonckheere (1973) discusses the successful treatment of a 19-year-old female cannabis user who had been formerly seen by four therapists before her mother was brought to treatment; he stresses the importance of early family therapy. Hirsch and Imhof (1975) describe the rudiments of an initial interview approach used with 47, mostly intact, addicts' families in which emphasis was placed on honest communication, release of affect, change of family role assignments, and attention to the curative powers of the family; results were described as "encouraging," but outcomes were not measured. Cotroneo and Krasner (1976) employed an intergenerational family therapy, derived from the work of Boszormenyi-Nagy and Spark (1973), which includes parents and grandparents; a case is presented with which this approach succeeded. Noone and Reddig (1976) see the drug addict's family as "stuck" at a stage in the family life cycle as a result of conflicted family loyalities; their treatment is partly based on the work of Boszormenyi-Nagy and Spark (1973) also, and involves affirming, clarifying, and redefining the loyalty system, along with resolving the bereavement and grief which is sometimes transmitted through several generations. Reilly (1976) has written an insightful paper on the psychodynamics of (primarily) nonopiate drug abusers' families in which he emphasizes the importance of family loss, mourning, and separation anxiety in the perpetuation of drug abuse. A cornerstone of Reilly's technique is the establishment of a 15-session, time-limited, treatment contract with the family which both (a) harnesses the family's "sense of crisis in the service of goal-directed change," and (b) through time-pressure, "reawakens old conflicts around separation." The "problem" is redefined as a family problem and focus is kept on the family. Specific treatment goals are sought, with less importance attached to the goals themselves than to the family's method of setting them. The family is encouraged to air disputes and feelings within the session, which allows concentration on the present and on the process of communication. Attention is paid to nonverbal behavior vis-a-vis the ways the family communicates, and direction is toward learning new ways of communicating. In

115

later stages of treatment, "grief work" intensifies, allowance is made for belated mourning, and a process is worked toward whereby the parents can manage to "let go" of their children, thus permitting them to separate and individuate.

In contrast to, say, educative or psychodynamic approaches, several of the programs discussed in earlier sections have applied a family systems orientation in their treatment. This appears to be the most common approach taken in the treatment of individual families with drug problems. While the various authors do differ on certain aspects of their technique, a number of basic similarities underlie most of their efforts. The major "schools" within the systems model which have been most influential in family drug treatment are Murray Bowen's (1978) intergenerational "family systems" theory, a version of the "strategic" approach used by Jay Haley (1973, 1976, 1979, in press), and the "structural" therapy described by Salvador Minuchin (1974). The latter two were partly developed together and some programs combine them.

Some of the authors who subscribe to systems approaches do not devote much space to their techniques. Cancrini et al. (1970), in writing of their research with teenage drug addicts in Italy, note only that in their experience family therapy can be both suitable and effective in dealing with such cases. Entin and Schumann (1971) tried to engage six families of drug-using adolescents in Bowenian family therapy; their paper is a retrospective analysis as to why, after a few exploratory contacts, they were unable to get any of them in. Howe (1974) hints at the repetitive cycles that families of adolescent drug abusers demonstrate and proposes the use of the identified patient as a kind of cotherapist, at least in the initial phases of treatment. He recommends avoiding a focus on the drug taking, because this is one way that such families sidestep problems in parenting.

A "personalistic" approach to treatment, based in part upon systems and ecological concepts, was taken by Friedman (1974) in treating 30 white, working- and middle-class families. The median age of the drug-abusing member was 17, and the sample included an even number of males and females. Most were polydrug users. Treatment revolved around emergent family alliances, loyalties, and conflicts and focused on creative problemsolving and conflict resolution through negotiation. Friedman espouses the value of ecological intervention with these cases, including the engagement of all relevant social systems, such as school, peer group, and vocational setting.

Brief strategic/structural family therapy has been used by Scopetta et al. (1977) in the Miami Cuban community. Most of the identified patients were using inhalants or barbiturates. This group is gathering outcome data, but they have yet to be published.

Drug-dependent mothers were the clinical population addressed in a paper by Freedman and Finnegan (1976). Their approach was also structural/strategic and viewed the problem as generating from a triadic system (e.g., the drug-dependent woman, her male partner, and her mother). These family members were engaged in mapping out tasks, goals, and family boundaries as part of the treatment. Outcomes were not presented.

A family-oriented, countrywide treatment network for substance abusers has been described by Levy and Joffe (1974). In addition to individual family therapy, couples therapy and couples groups are also included. The therapeutic approach is systems-oriented, with a transactional flavor. A structured treatment plan is established with each family and a time-limited format is agreed upon—usually 10 sessions. A variety of specific techniques are used, such as communications exercises, task assignments, psychodrama, family mediation, and videotape feedback. Through a series of courses and seminars, several hundred treaters from the community have received at least basic training from personnel in this program.

One of the few studies with control groups was performed at a therapeutic community and hospital for people addicted to drugs and alcohol (Ziegler-Driscoll 1977, 1978a, 1978b). It was adjunctive to a large clinical investigation of the efficacy of combining programs for drug addicts and alcoholics. The patients were initially enrolled in the therapeutic community and became part of the family treatment project at the end of their 45-60 day inpatient stay. Of the 170 cases selected, only 79 (46 percent) finally completed the initial research interview which was required for them to be included in the family study. These 79 were randomly assigned to one of three treatments. Two were family programs—a brief (5-20 session), structural family therapy outpatient mode, and a program of similar length in which relatives of the identified patients met in outpatient groups; 65 percent of those assigned to family treatment actually became involved in it, the highest dropout rate being among lower-income blacks. A control group was made up of families who were not involved in treatment. The family treatment was, in the true sense of the word, exploratory, as three of the four therapists had had no experience as family therapists, the fourth had minimal experience, and all of the therapy supervisors were new to the field of addiction; they were setting about to learn what "works" with these patients within this context. Ziegler-Driscoll (1977) has presented preliminary data on the cases which were included early in the sample period. At 4-6 month followup no differences were found between the three groups as to number of patients who were abstinent from all drugs. If those who actually received family treatment (i.e., excluding patients assigned but never engaged) are compared with controls, the percentages of abstinent subjects are 56 percent (family treatments) and 42 percent (controls). However, this latter comparison may be as much a result of selection as of treatment effect. A later inspection of the data indicated that certain subsamples of the overall group did appear to profit from family treatment relative to comparable subsamples of controls. Also, as the therapists became more experienced they became more effective. Further, changes in family members were not assessed. Finally, the use of a "totally abstinent" dependent variable appeared to wash out differences which would have emerged if a less rigid variable such as percentage of drug-free days were used (Ziegler-Driscoll 1978a, also personal communication, December 12, 1977).

The above study should not be dismissed lightly—not so much for its results, as for the lesson it teaches about the difficulty of doing research in this area and the importance of the context within which treatment and research are undertaken. Ziegler-Driscoll (1977) has presented the problems and stumbling blocks encountered by the project with a candor which is both refreshing and rare. Some of the major difficulties were: (1) the Family Study came on the heels of, and was partly associated with, a large-scale research program which had caused tremendous turmoil and resentment among staff; such feelings were readily conveyed to the patients, who then shared the negative attitude which generalized to the Family Study; (2) the ethos of the therapeutic community (TC) and of the Family Study were not particularly compatible, since the former saw family relationships as destructive influences to be avoided, and the latter saw residential treatment as too divorced from the interpersonal and family pressures existent in the outside world; such attitudes also get conveyed to patients, and since the clientele were, first of all, TC residents, the TC point of view received primacy; (3) because of the TC regimen and "blackout," family treatment began at the tail end of inpatient treatment, or in many cases weeks or months after it had terminated (due partly to construction delays); these factors served as major impediments in getting families to enroll or stay in treatment, and in any case reinforced the idea that the problem was the patient's, not the family's; (4) some of the families had to make long or inconvenient journeys to get treatment, which reduced retention and attendance; (5) the project may have bitten off more than it could chew as far as sample characteristics are concerned, for it was trying to concurrently develop techniques with a diverse group of both alcoholics and drug addicts of different ages, marital statuses, ethnic backgrounds, etc.; the more usual method is to select a circumscribed group and try to define the therapeutic techniques and parameters which apply to it only; (6) the investigators have to be admired for the probity shown in their willingness to match an unexplored treatment approach, performed by untrained personnel, against an established mode; most psychotherapy researchers tend to have their techniques pretty much honed down before pitting them against competition. In short, an untried treatment approach, performed by inexperienced therapists and supervised by people unfamiliar with the patient population, was attempted with difficult cases in a hostile environment in which additional institutional variables mitigated against many patients ever receiving it. With so many built-in systems problems, the results that were obtained could hardly have been otherwise.

The only other outpatient family therapy study which used comparison groups was performed with heroin addicts in a methadone program (Stanton 1978d; Stanton and Todd 1976). The sample was composed of lower- and working-class males under age 36 and included an equal number of blacks and whites; all were in contact with parents or parent surrogates (e.g., mother's boyfriend). Four treatment conditions were compared: paid family therapy, unpaid family therapy, paid family movie treatment, and nonfamily treatment (methadone and individual counseling). Random assignment was used. The three family treatments were brief, i.e., 10 sessions. Family members in the paid groups were reimbursed for attending sessions and also stood to earn more money if their addicted family member was "clean" that week—an intervention which focused their attention on his drug taking and reinforced them for putting pressure on him to abstain. Movie treatment required the members to come to the clinic as a family each week to view movies together. A structural/strategic approach to treatment was used, the specifics of which are described at length elsewhere (Stanton and Todd 1978; Stanton et al. 1979). Some of the major clinical findings which emerged were:

147

(a) a great deal of effort had to be expended to get families into treatment, but this was accomplished with 70 percent of the cases; (b) as also noted by Davis (1978) and Gasta and Schut (1977), the therapist had to have control over, or major input into, medication decisions in order for therapy to be successful; (c) a crisis in the family inevitably occurred approximately 1 month into treatment, as change started to take place; (d) urinalysis results were extremely important in allowing families to track ongoing progress; (e) in cases with married addicts, the relationship with family-of-origin had to be dealt with first—before focusing on the marriage—if treatment was to succeed. Followups 6 months after treatment had terminated (N=95) showed the following results in terms of percentage of days free from various drugs (Stanton et al. 1979): (a) all three family treatments differed significantly from nonfamily treatment in the use of illegal opiates, all illegal drugs, and a combination of all illegal drugs and alcohol; (b) both family therapy conditions differed from nonfamily treatment in the use of all nonopiate illegal drugs; (c) paid family differed from nonfamily in the use of all legal and illegal opiates; (d) paid family and movie differed from nonfamily in alcohol consumption; (e) paid family differed from movie in the use of all legal and illegal opiates, all nonopiate illegal drugs, and all illegal drugs; (f) the two family therapy conditions did not differ significantly from each other on any drug use variables. No differences were found among the groups as to percentage of days spent working or in school. In comparisons where unpaid family therapy differed from nonfamily treatment, the ratio of days free for the former was 1.4 to 2.7 times as great as the latter, depending on the particular dependent variable. For example, the mean percentages of days free of nonopiate illegal drugs were: nonfamily, 44.1; movie, 55.7; unpaid family, 63.6; and paid family, 78.8. For all illegal drugs the means were: nonfamily, 25.1; movie, 45.7; unpaid family, 50.5; and paid family, 67.1.

Sibling-oriented Treatment

The only known work published in this area has been done by Coleman (1978a, 1978b). It involved a family-oriented group therapy program for siblings of drug-addicted identified patients. All of the members were either presently or had previously been in family therapy within the program. The group was established mainly as a preventive step, to keep these siblings from becoming involved with drugs. The author mentions that most of the members, i.e., those about whom she had received word, were off drugs and doing better 1 year later.

Multiple Family Therapy

The first paper published specifically on multiple family treatment for drug abuse was by Klimenko in 1968 (although Wolk and Diskind had recommended such an approach in 1961). She described an outpatient program in which a number of drug addicts' families were treated conjointly by cotherapists in an effort to improve family communication and promote understanding among members. Ganger and Shugart (1966) used a similar approach. A Canadian program by Alexander and Dibb (1975) treated white, middle-class families in brief (5-8 session), strategically oriented, multiple family therapy (MFT); most of the identified patients were outpatients on methadone.

Several authors have described MFT in an inpatient or therapeutic community (TC) setting. Berger (1973) used it with female addicts and their families who met monthly in a group of 40-50, for an average of five sessions. Multiple family play group therapy, in which approximately one-third of the parents were diagnosed as having a substance abuse problem, was instituted by Webb and Bruen (1967-68); the major thrust was to observe and work on the relationships between these patients and their families, especially their children. Brown et al. (1973) introduced it to prevent the recidivism that had been occurring when their adult addict patients were discharged to their families; although they mention that outcome data were obtained in a followup study, these were not published. Kaufman and Kaufmann (1978b) used MFT within a TC; their approach was primarily structural and included such techniques as boundary setting, psychodrama, family sculpting, and videotape feedback. Bartlett (1975) describes a more psychodynamic approach to MFT with ghetto dwellers. Two types of groups were treated—one being for couples in which either or both were addicted, and the other for drug-abusing adolescents and their families. A major goal in both approaches was for each family or couple to reach a decision or plan for the future, including whether or how to continue treatment. Since MFT was held within a residential setting, with no facilities for outpatient continuation, treatment was necessarily restricted to 4-6 sessions. Bartlett feels that this limitation hampered treatment; it engendered a certain amount of frustration since it was often too brief to resolve problems satisfactorily.

A three-session, multiple-family communications program for families of adolescent drug users was evaluated by Funk (1974). Participation for the 62 subjects was ordered by the Juvenile Court, and groups were led by trained, nonprofessional volunteers. Sessions were divided into a half-hour didactic/educational component, followed by smaller, mixed adult-teen groups. Comparisons of court recidivism were made between the 9 month period prior to participation and the 9 months following program completion. Recidivism for all court offenses was reduced by 72.6 percent; decreases of 76.6 percent and 86.8 percent were noted for severe offenses and drug offenses, respectively. There was no control group, but comparison with an earlier version of the program with the same client population—in which professional group leaders were used—showed significantly better results by the nonprofessional groups in reduction of both total and severe offenses. This study is notable both for its use of nonprofessionals and for its relative low cost-to-effectiveness ratio.

The earliest outcome study of family treatment with drug abusers was performed by Hendricks (1971). The work was done with narcotics addicts in an inpatient setting and average treatment length was 5.5 months. All patients engaged in daily group therapy. In addition, most of them were involved in various small therapy groups, including MFT. Of the family members who attended, 81 percent were wives or fiancees. Eighty-five MFT participants who had experienced at least 8 sessions were followed up 1 year after discharge. Results showed that 41 percent were still involved in the compulsory outpatient treatment (rather than being readmitted or imprisoned) and urinalysis tests indicated they were not using narcotics. This compared favorably with a 21 percent rate for followup of patients in the overall inpatient program (which included other types of group treatment) and 18 percent for other programs within the local area; essentially, the number of cases with positive outcome was increased twofold. However, since patients in the various therapy groups were self-selected and not randomly assigned, the results must be viewed with caution.

Social Network Therapy

The innovative use of "social network intervention" as part of a 9-12 month therapeutic community program has been described by Callan et al. (1975). It involves bringing together the significant members of a residents' inhouse and out-of-house social environment for a multipurpose conference. Typically 15-25 people are involved in the 1-3 hour sessions, and these may be held at entry, near termination, or when external (e.g., family) events affect the resident. It can serve a number of functions, such as information gathering, but generally evolves into an effort to diagnose problems and plan treatment. Arrived-at goals usually are defined in terms of observable behavior and must be agreed upon by the members of the network. The authors have determined that this approach is most effective if the primary leader is a relative "outsider" to both the therapeutic community and the residents' external social system.

IMPLICATIONS

The most basic implication from the foregoing discussion pertains to the conceptual framework applied to drug taking and the people who engage in it. Treatment from a family or interpersonal systems viewpoint rests on certain assumptions about relationships and behavioral patterns which are in some ways discontinuous with most other conceptual schemata. They sit at a different level of theoretical integration. For example, we tend to apply sociological, political, and legal frameworks, rather than biological, in explaining national trends in substance abuse. Conversely, we would be more liable to look at either physiological/biochemical or conditioning factors in explicating the detoxification process. An interpersonal/familial interpretation uses a different basic unit for explanation which is neither individualistically nor sociologically anchored. In a way, it falls in an intermediate position within the spectrum of integrational theories. The essential question is whether it "makes sense" of the data upon which it is based, and consequently leads to (a) legitimate, predictive explanations of drug-taking behavior, and (b) theories and methods which can help bring about efficient, durable change. While present evidence is indicative and promising, the question, in all its ramifications, is at best only partially answered. However, much as Einsteinian physics requires a different frame of mind from the Newtonian variety, a different thinking cap must be donned to answer questions of import within the interpersonal/familial systems area. It might be helpful to keep such points in mind when considering the discussion of further implications.

Implications for Treatment Activities

Clarification of technique. While most of them are based on certain basic principles, the diversity of family treatment approaches described in the literature is striking. Much of this can be ascribed to attempts to mold familial approaches to fit within existent programs, since funds and other support are not readily forthcoming for new or "radical" treatment modes. This diversity is probably healthy, since no one can expect to have "the answer" at this stage in the game. What may be most unfortunate, however, is the notable lack of attention given to the efficacy of the treatment employed. There is also a (related) paucity of information on specifically what can be done, clinically, to bring about change in certain situations with certain clients. Authors have not consistently given their readers guidelines or "how to do it" information. This, again, is partly because most of them were exploring, and hesitated to make conclusive statements. Then, too, most of the existent theories in the drug field were not developed with this kind of treatment in mind, and were, therefore, not applicable in ascertaining therapy strategy. However, we now appear to be at the point where some principles can be offered and their parameters defined. At least two forthcoming volumes in the field should provide structure and impetus for this endeavor (Kaufman and Kaufmann 1978a; Stanton et al. 1979).

Family recruitment. One of the problems that has been identified with this approach is the difficulty involved in getting family members into treatment, particularly fathers (Alexander and Dibb 1975; Davis 1978; Entin and Schumann 1971; Fram and Hoffman 1973; Mason 1958; Seldin 1972; Vaglum 1973; Ziegler-Driscoll 1977). They frequently appear threatened or defensive, wishing to avoid the blame they fear the therapist will place on them. Involving them seems to require different techniques than have conventionally been applied in family treatment with other kinds of disorders. More energy may have to be devoted to outreach efforts. When this is done, the results can improve considerably. Alice Coleman (1976), Davis (1978) and Vaglum (1973) have described a number of strategies which can help, as have Stanton and associates (Stanton et al. 1979; Stanton and Todd 1979; Van Deusen et al. 1979). In the latter work, successful recruitment of whole families, including both parents, was achieved 70 percent of the time—a "hit" rate which is much higher than that noted in other published reports. This may be an area of future investigation in which innovation will be most readily embraced.

Direction and effectiveness of treatment. The reader should not be misled into thinking that bringing a family in and discussing problems, per se, constitutes effective therapy. This is no more a precondition for change than is the resolve to be "well intended." Most therapists and therapies are well intended, so the key issue is whether or not their methods work, or at least whether they work better than other modes. Families of drug abusers can be very difficult to treat, and also quite draining. A certain amount of skill is involved, including the ability to avoid getting triangulated to the point of incapacitation. Having observed the family treatment techniques of a number of drug treatment facilities from around the country—either directly or through videotapes—this writer is particularly concerned with the "fuzzy" thinking and unsystematic approaches that some of them have applied. Too often treaters have had vague goals or goals counter to those of the people they are treating. Others have become so enamored of the family dynamics they see, that the means for effecting change escape them. While it is not the intent here to squelch exploration and innovation, more is involved in family therapy than sitting and "grooving" with families. Treatment of this sort benefits neither the clients nor the field of drug abuse as a whole.

Two other points deserve emphasis. First, as Kovacs (1975) and others have asserted, the practice of treating the drug abuser and his family members separately or concurrently does not appear to be as promising or efficacious as treating them together, i.e., in a situation where their interactions and relationships can be directly observed and altered (Gurman and Kniskern 1978). Second, in this author's opinion, it is doubtful that any family treatment mode for "hard" drug addiction can be effective which does not address the addictive cycle, per se. In this cycle, when the addict improves, or tries to "clean up", the family enters into a crisis; frequently his parents begin to split up or talk about divorce. When he becomes readdicted, such talk subsides and the family unites around its "troubled member." So it is really a family addictive cycle (whether acknowledged as such by the addict or not). The point is, if treatment is not constructed to directly intervene in and change the family process surrounding detoxification and readdiction, such treatment is much less likely to succeed. (See Stanton et al. 1978, for a more complete account of the family system behaviors involved in the addictive cycle).

Confidentiality. If drug misuse, especially of the heavy or compulsive variety, is seen as a family phenomenon, or as symptomatic of a larger family problem, many of the existent regulations concerning confidentiality from family members do not make much sense. While there may be exceptions, such as in acute emergencies, or in situations where an experimenting adolescent has an adverse reaction, some of the standing regulations may serve in the long run to perpetuate rather than alleviate the difficulty. To shield a person's drug problem from his family may even be an exercise in self-delusion—they often already know about it—but at the very least it results in a "buying into" and rigidification of the existent family system. Drug abusers are frequently protective of their families and often protest that the problem is theirs rather than the whole family's. Confidentiality provisions can give license to this denial by officially sanctioning the identified patient as the problem and denying the importance of the family system and the significant others within it. This can be especially problematic with adolescents and minors who are still the wards of their parents. The author has known of cases where youthful abusers have been sequestered for months and their families not informed of their whereabouts in order to conform to confidentiality constraints. There is a need to delineate more clearly the boundaries between confidentiality as it applies to family members, versus the safeguards it insures vis-a-vis nonfamily individuals and agencies. While it is recognized that these regulations often were wrested from legislatures and government agencies at considerable cost in time, effort, sweat, and lobbying activity, consideration of the family basis to drug problems dictates that many of them be called into question.

Treatment delivery systems. A number of implications for drug programs and treatment systems can be identified, based on the material presented thus far. For example, one of the criticisms which has been made of traditional therapeutic communities is that their patients must be discharged back to the "real world" and to the family. If these pretreatment influences remain unchanged, pressure is exerted on the patient to return to his old patterns. Including the family in treatment helps to counter this problem, since it amounts in many ways to bringing the real world into the clinic. This also applies to learning and conditioning paradigms, given that the family is a major source of stimuli and reinforcement for many patterns of behavior. Consequently, treating all of the members together allows more control over these prepotent variables (Berliner 1966; Olson 1974).

If families are to be treated, there appears to be a need for better dissemination of information about available facilities, especially at the local level. Chambers (1977) has data indicating that half the families for whom treatment is indicated either are unaware of existent resources or find them unacceptable.

One area that also needs attention has to do with the administrative handling of family treatment. Many procedures are geared to individually oriented therapies and are not responsive to family approaches. A problem identified by Coleman and Davis (1978) in their visits to drug programs was that counselors and therapists were not always allowed census credit for seeing family members. In some cases they were directly penalized, because sessions held without the identified patient present, e.g., if the parents or spouse were seen alone, were disallowed on their timesheets; they were also not given credit for the additional time required for contacting and coordinating with family members. Another problem encountered by the writer in a particular institution concerned billing procedures. Each family member was registered separately as a patient and billed accordingly. Thus if one member was present for a session, the fee was, for example, $15.00. If five members attended, the family was billed five times as much, i.e., $75.00, for the same 1 hour session.

Further, difficulties can arise even from policies and regulations established at the national level. Kleber (1977) notes that current Federal funding mechanisms, by supporting individual "slot" costs (as opposed to treatment unit costs), not only do not provide incentives for attendant therapies, but may induce a disincentive for provision of family and related treatments. He notes that the end result is a tendency "to penalize programs that attempt to do effective therapy with the patient and his family" (p. 271).

As mentioned earlier, conceptualizing drug taking within an interpersonal systems or family framework is not always consonant with some of the other ways in which treatment has been administered in the drug abuse field. This can become particularly apparent within actual clinical settings. Schwartzman and Kroll (1977) note how many programs feed into and recreate the family system of the abuser—i.e., "unspoken conflicts between staff members frequently are acted out through individual patients and result in requests for more medication and more frequent illicit drug use" (p. 497). In a sense, they can reinforce the family's idea that the identified patient is "sick," incompetent, and unable to stop taking drugs (Schwartzman 1977; Stanton et al. 1978). This is a very real issue, and recognizing it prompts that close consideration be given as to how our drug programs may be unwittingly fostering the very behaviors they are mandated to extinguish.

A final note on treatment implications has to do with acceptance by others within the field. New methods and ways of thinking are rarely greeted with open arms in any field of endeavor. The interpersonal/family systems approach has garnered its share of resistance (Haley 1975). In many ways it is in a position analogous to that encountered by behaviorally oriented treatments several years ago, i.e., proposing new perspectives and methods to groups which were invested in the old ones. In contrast to its brethren in other mental health areas, however, the drug abuse field has, in this author's estimation, been remarkably open to new and different approaches. Perhaps because of (a) the difficulty in treating its patient population, (b) the objectivity acquired in assessing its target symptoms, e.g., urine tests, which permit more accurate assessment of outcome, (c) its shared emphasis with many family treatments on the "here and now," or (d) its general newness as a field (DuPont 1978), it has allowed a thousand flowers to bloom. Thus, the "surprising" way in which family treatment modes have gained at least partial acceptance in so many drug programs across the country may not be so surprising after all.

Implications for Training

Perhaps the most notable implication for training in family treatment pertains to the widely expressed need for it that emerged from the findings of the Coleman survey (Coleman 1976, Coleman and Davis 1978). Of the programs which were queried, the majority wanted more training—particularly in the use of videotapes for family therapy training and supervision. The greatest need was among methadone clinics, which also were the least likely to have actually been providing treatment to families. (If they did provide it, however, it tended to be given by less experienced therapists [Coleman and Kaplan 1978].) The overall level of experience and sophistication in family treatment was not considered high as measured by a progress index (Coleman and Stanton 1978a), but the interest in improving this was great.

There is an implicit danger in this whole area which must be considered. As family systems methods become more widespread, a "fad" could develop. This might lead to inadequate training of many personnel who then proceed to do ineffective therapy. Family therapy cannot be learned overnight. Although efficient training models have been developed (e.g., Flomenhaft and Carter 1977), and it appears to take less time to reach competence than is required for most individual modes, the direction, content, and length of future training curricula deserve careful consideration.

Implications for Prevention

Of the various approaches to psychotherapy, family treatment has perhaps the clearest implications for prevention. This is because (a) more people are involved when one sees a family, (b) it engages people (e.g., parents) who may not otherwise have gotten into treatment themselves, but who engender problems in others, and, (c) if effective, a system is changed which, prior to treatment, had the potential to produce other offspring with problems. For instance, if parents are helped to improve the ways in which they handle a son or daughter with a problem, they are becoming more competent parents. Their experience will hopefully provide them with ways of dealing with younger children as these grow older, i.e., the lessons learned with one offspring can be transferred to others. In fact, the work of Klein et al. (1977) with delinquents indicates that family therapy can result in clear-cut prevention of future problems among siblings. Further, if the family situation is changed so that an addicted member is set free of the needs of his parents and therefore, in part, his need for drugs, he is on the road to becoming a more competent person, and in the long run a more competent spouse and parent himself. This, then, is primary prevention.

Some specific target groups for which family treatment appears particularly appropriate as a preventive mode are: children of addicts (Nichtern 1973; Silver et al. 1975); siblings of drug abusers (Coleman 1978a, 1978b); parents of junior and senior high school students (Ziegler-Driscoll 1977); parents threatened with the "empty nest" syndrome (Curlee 1969); and families in crisis (Wieland et al. 1975).

Implications for Future Research

While many possibilities exist for research on the families of drug abusers, only a few which pertain directly to treatment will be presented here.

Outcome. Concerning nondrug-related disorders, the field of family therapy appears to have come of age. In a review of the literature, Gurman and Kniskern (1978) located over 200 studies of family or marital treatment which presented outcome data. Of those in which family therapy was directly compared with other modes of treatment, the former emerged with superior results in two-thirds of the studies and equal results in the remainder. Unfortunately, the same level of scientific activity has not prevailed among programs providing family treatment specifically for drug problems. While the few existent studies with outcome data show considerable promise, it is too early to consider them conclusive. Rather, there is a glaring need for well-designed research in this area which compares two or more treatments and employs random assignment.

Technique. More precise methods need to be defined and developed for dealing with particular subpopulations. Investigators need to carve out an area and explore it, rather than falling into the trap of a shotgun approach. For instance, one might ask whether approaches should differ in working with single parent families, marital couples or intact families? Is the same approach to be taken with families from all ethnic groups, and if not, how should it be adapted? Klagsbrun and Davis (1977) pose the question of whether substance-abusing families are a homogenous group or whether a meaningful typology can be established which is attended by differences in treatment approach. Finally, there is evidence that the high rate of death and suicide seen among drug addicts derives from family factors (Stanton 1977). The means for dealing with this serious problem from a family systems standpoint need further exploration (Coleman and Stanton 1978b, Stanton and Coleman 1979).

Responsibility. Families of drug abusers have too often been able to foist their addicted members on the treatment system, thereby abdicating responsibility. Treaters have too willingly accepted this yoke, and then ended up feeling responsible, to boot, when families directly undercut them and treatment failed. We need research on how to turn this situation around. We must develop methods which help families to feel more competent to change their patterns and to care for their own. If, as Blum and Associates (1972, p. 34) have stated, "the family is a force that helps resist or exaggerate the stress of other environmental factors," the need becomes clear for finding ways to strengthen the resistances and minimize the exaggerations.

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12. Treatment of the Polydrug Abuser

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The term "polydrug" became widely publicized by a federally implemented polydrug research and demonstration project developed in 1973 to study the nature and extent of nonopiate abuse (Benvenuto and Bourne 1975). At that time, the National Institute on Alcoholism and Alcohol Abuse was funding treatment for alcohol-related problems, and the Federal focus on drug abuse treatment was for heroin problems. For this reason, the Federal definition of polydrug became the primary abuse of drugs other than alcohol or heroin. According to this definition, abuse of a single drug, e.g., barbiturates, would be classified as polydrug abuse (Wesson et al. 1978).

With the exception of the Polydrug Project efforts, polydrug abuse is commonly defined as simultaneous or sequential use of more than one psychoactive drug for nonmedical purposes (Tinklenberg and Berger 1977). Some authors include alcohol; others do not. Multiple drug abuse and mixed addictions are used more or less synonymously with polydrug abuse. This use of polydrug parallels the concept of polypharmacy used in medical therapeutics. In this chapter, polydrug abuse applies to the simultaneous use of different psychoactive drugs including alcohol.

Drug abuse treatment is frequently conceptualized in terms of a specific treatment modality based upon the drug of abuse, for example, methadone maintenance used for the treatment of heroin dependency. While drug-specific treatment has some clinical utility in the sense that it specifies the type of drug problem suitable for treatment (e.g., methadone maintenance may be an appropriate treatment for heroin dependency but not barbiturate dependency). Sells and Simpson (1976) have noted that methadone maintenance is not a unitary treatment concept as programs differ significantly in their mode of dispensing, maintenance dosage levels, and use of adjunctive treatment modalities. Most other treatment modalities (e.g., individual or group psychotherapy) differ widely in their implementation and fail to qualify as unitary treatment concepts.

Because of the heterogeneity of the polydrug-using population and the wide range of treatment settings, we prefer to conceptualize treatment of the polydrug abuser as a series of strategic interventions which can be adapted to various individuals and settings using rational guidelines. The timing of interventions is critical, and a treatment intervention which may be highly effective at one time in an individual's efforts to move away from the destructive use of drugs may be contraindicated at another time. For this reason, comprehensive treatment is best divided into clinically useful phases. One possible scheme is shown in table 1.

While many patients will enter treatment during phase 1 (or crisis intervention), others may directly enter detoxification (phase 2), and still others will enter the short-term stabilization phase. At times, an individual's treatment may need to revert to a previously completed phase. An example would be the individual who resumes drug use and overdoses during phase 3 or 4, requiring crisis intervention techniques to be employed. The importance of the model is to allow the clinician a logical framework in which to plan treatment interventions. Most treatment plans thus constructed will involve the simultaneous utilization of several interventions whose effects are complementary and, at times, TABLE 1.–*Phases of d*

Categories of services	Phase 1 Crisis service (1-2 days)	Phase 2 Short-term stabilization (0-4 weeks)
Medical	Treatment of– overdose acute withdrawal symptoms acute medical problems	Detoxification
Psychological	Crisis intervention, suicidal and homicidal thoughts Acute anxiety reactions Acute psychotic reactions	Psychological supp during detoxifica Group, individual psychotherapy
Residential	Emergency housing Hospitalization	Arrange supportiv environment for detoxification
Economic	Emergency social service funds	Initiate disability
Work/educational	Assist in arranging leave of absence from work/school	
Legal	Diversion from criminal justice system	

rug abuse treatment

	Phase 3 Long-term stabilization (4-24 weeks)	Phase 4 Rehabilitation (6 months-2 years)
	Evaluation and treatment of chronic medical problems	Arrange for ongoing medical/psychiatric care
ort tion	Short-term psychotherapy Initiate biofeedback relaxation therapy	Analytical psychotherapy for depression, anxiety
e	Halfway house placement Investigate alternative residential placements	Initiate long-term living situation
	Assess feasibility of return to work	Return to gainful employment if possible
	Evaluate vocational rehabilitation potential Evaluate possibility of return to school	Vocational rehabilitation referral Assist in applying to school
	Resolution of pending legal charges	Followthrough plan for conditions of probation or necessary court appearances

synergistic. The methods discussed here are a small subset of possible treatment interventions selected because of their general usefulness or newness.

The polydrug-using population is very diverse in terms of age, socioeconomic status, and reason for using drugs. Polydrug abusers whose primary motives for consuming drugs are social/recreational must be treated differently from individuals who are abusing drugs in an effort to self-medicate pain, anxiety, or other psychic discomfort (Carlin and Stauss 1978). Youthful drug users who are using drugs in a social/recreational manner find storefront clinics acceptable as places to obtain treatment, whereas many individuals prefer treatment in a more traditional medical or psychiatric setting (Wesson et al. 1975).

Crisis intervention plays an important role in the delivery of drug abuse treatment services (Wesson et al. 1974). The crisis situation is frequently the drug abuser's entree into treatment, and the skill with which crisis services are provided is often pivotal regarding the individual's decision to remain in treatment after the crisis is resolved.[1]

Polydrug abusers may present for treatment with a bewildering array of medical complications, psychiatric syndromes, and drug-induced reactions (or interactions). Although there is a vast literature which emphasizes differential features which distinguish psychiatric syndromes from toxic reactions produced by psychedelic drugs, sympathomimetics, or drug withdrawal states, Sapira and Cherubin (1975) present a review which raises considerable doubt concerning the extent to which such differentiation is possible on initial assessment.

Staffing patterns of drug abuse treatment facilities frequently place their more junior members or even trainees in the crisis intervention role. Diagnostic assessment and appropriate intervention in the crisis situation require the utmost skill and should generally be done by the most knowledgeable, experienced members of the treatment team.

PSYCHOTHERAPEUTIC INTERVENTIONS

Individual psychotherapy or the process of meeting with the patient on a one-to-one basis for the purpose of discussing problems, offering advice, examining relationships, and trying to understand the reasons for an individual's behavior, is likely to be called psychotherapy when done by a psychologist, psychiatrist, or clinical social worker, and counseling when done by others. Individual psychotherapy alone is not a highly regarded treatment modality in the drug abuse field. Psychoanalytic psychotherapy for narcotic addiction is described by Rado (1957) and Fenichel (1957). A review of the literature (Sapira and McDonald 1970) indicated a response rate of 50 percent. Pearson and Little (1965) also report successful treatment with conventional psychotherapy. Individual psychotherapy, particularly in drug treatment programs, is done by individuals with a wide range of training, skills, and treatment orientation, a fact which complicates empirical assessment of efficacy. While psychotherapy may be useful during all phases of treatment, the orientation and focus of content change as the individual progresses through treatment phases. During crisis intervention, psychotherapy is problem-resolution-oriented, and may be very directive and/or instructive. During detoxification, individual psychotherapy can be supportive of the detoxification process by allowing the patient a framework for discussing the emotions which emerge as the patient's drug use is reduced. In addition, regular psychotherapeutic sessions serve to establish rapport and trust and assist in keeping the individual in treatment. After the psychotherapist-client relationship becomes established (usually by phase 3), the relationship can be a powerful influence over the patient's behavior. The psychotherapy sessions can be used for identification and assessment of new problem areas, definitions of goals, and offer the opportunity to assess the need and impact of other treatment interventions. Psychotherapy during this phase probably exerts much of its therapeutic effect by identification with the therapist and through modeling of the therapist's problemsolving skills.

For patients whose drug use was motivated in an attempt to self-medicate neurotic conflict, affective disturbance, or to defend against emergence of psychotic process, long-term individual psychotherapy is indicated in phase 4 of treatment. Psychotherapy during this phase can be more psychodynamic, or "insight oriented," and nondirective. The transition to this phase of psychotherapy is frequently problematic. The psychotherapeutic style helpful during the earlier phases of treatment may become a liability during phase 4, and the psychotherapist may have difficulty making the transition. At times, it may be appropriate to use the initial psychotherapeutic relationship to assist the individual into a long-term psychotherapeutic relationship with a different therapist. With drug abusers, a psychotherapist-medical manager split is frequently helpful in preventing psychotherapy from becoming focused on medication schedules, dosages, side effects, etc.

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[1] Thus, the goals of crisis intervention are to resolve the presenting complaint and to foster more definitive therapy.

Group therapy refers to a wide range of activities which take place during treatment of the drug abusers. Like individual psychotherapy, group therapy cannot be considered a unitary modality because of the diversity of therapist styles and orientation. Group activities can be confrontive, supportive, analytical, growth oriented, educational, or task oriented. Groups conducted by Alcoholics Anonymous or Narcotics Anonymous are structured and conducted very differently from traditional psychotherapy groups. While all types of group activities have a place in comprehensive treatment intervention programs, patients should be carefully selected for each group and attention to the timing of introduction is important. Phase 2 groups should usually be supportive, educational, or task oriented. Confrontive or self-help groups are generally more appropriate in phases 3 and 4, especially with the recreational drug abuser. Psychotic individuals may further decompensate during group confrontation, and prove frustrating to self-help groups when they interject inappropriate or tangential remarks. Traditional psychoanalytic psychotherapy led by an experienced professional is best introduced in phase 4 for individuals who have the capacity for introspection and ability to form empathetic relationships. Individuals who are psychotic are best treated in supportive group or individual psychotherapy, and individuals who are not psychotic but who have personality disorders are best treated in a confrontive group setting, preferably as part of a residential living setting.

PHARMACOTHERAPY INTERVENTIONS

The judicious use of psychotropic medication can be an effective intervention at any stage of treatment (e.g., Narcan to reverse the effects of opiate overdose, phenobarbital for sedative-hypnotic detoxification). Pharmacotherapy can be considered under four nonmutually exclusive categories whose therapeutic rationales are sufficiently diverse such that each is discussed separately.

Detoxification, the process of safely withdrawing the individual from the drug of abuse, described in detail in chapter 2,[2] will not be discussed further here.

Drug maintenance involves the use of prescribed amounts of the drug of abuse or a drug with similar properties. In the treatment of heroin dependence, for example, methadone develops tolerance in the individual to the narcotic effects which are cross-tolerant with heroin. Since this tolerance blocks the effects of heroin, the individual's incentive for using heroin is greatly reduced. No comparable tolerance-producing agent exists to block the effects of sedative-hypnotics or stimulant drugs. Because of a tendency for polydrug users to escalate dosage as tolerance develops, maintenance on the drug of abuse is generally not feasible, although there are cases in which carefully controlled prescriptions of the drug of abuse can be used advantageously.

Treatment of the individual with drugs which block the desired effects of the drug of abuse is called antagonist therapy. Cyclazocine (Freedman et al. 1967) and naltrexone (Martin et al. 1973) have been used experimentally to block narcotic effects. Widespread use has been hampered by their propensity to produce dysphoria (cyclazocine), and their unacceptability to many narcotic abusers. A variant of antagonist therapy is the use of disulfiram (Antabuse) in the treatment of alcoholism. Ingestion of alcohol after ingesting Antabuse results in nausea, vomiting, and other unpleasant and sometimes dangerous signs and symptoms. Alpha-methyltyrosine has been found to block the euphoria and stimulation producing effects of alcohol in man (Ahlenius et al. 1973). In rats, alpha-methyltyrosine prevented intravenous self-administration of morphine and amphetamines (Davis and Smith 1972). Berger et al. (1973) have reported partial blockage of the CNS stimulant effects of amphetamines by fenfluramine in rats. No true antagonist exists for the effect of sedative-hypnotics.

In psychotropic drug therapy, the goal is treatment of underlying psychopathology which may be contributing to the individual's drug-abusing behavior. Generally, this is best reserved for phase 4 of treatment, although it may be instituted during phase 3 if need is clear. Many patients experience transient disturbances in mood, sleep, increased anxiety, and decreased pain threshold during the withdrawal period. These should be handled nonpharmacologically if possible. Assessment of the feasibility of psychopharmacological treatment should take into consideration the patient's past response and experience with medications, the patient's attitudes toward medications, the patient's reliability in taking medications as prescribed. Unfortunately, psychopharmacological treatment of many drug abusers—even when clear-cut indications exist—is not feasible because of their inconsistent and unreliable usage of prescribed drugs and their intermittent use of illicitly obtained drugs. While the use of certain psychotropic medications may be clearly indicated from a psychological diagnostic perspective, the hazards of such therapy may contraindicate its use. Sometimes, with careful administration of the drug at a halfway house, drug abuse treatment staff can circumvent the problem of inconsistent or unreliable drug usage, although concurrent abuse of illicitly obtained drugs may still expose the individual to the risk of adverse drug interactions.

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[2] See R. G. Newman's "Detoxification Treatment of Narcotic Addicts," this volume. Also, see B. Stimmel's "Drug and Alcohol Treatment," and D. Smith, D. Wesson, and R. Seymour's "The Abuse of Barbiturates and Other Sedative-Hypnotics," this volume.

Tricyclic antidepressants, for relief of depression and associated symptoms such as insomnia, are frequently useful. Pharmacotherapy with tricyclics may be of value in treating the rebound depression amphetamine abusers experience after detoxification (phase 3). Progress is enhanced by a balanced approach using a tricyclic antidepressant for relief of depression while involving the client in other forms of treatment such as psychotherapy and residential treatment. Woody et al. (1975) have reported the combined use of doxepin (Sinequan) and methadone in 35 mildly depressed methadone maintenance clients and observed decreased depression and improved participation in rehabilitation. Elavil (amitriptyline hydrochloride) and Tofranil (imipramine hydrochloride); 100 to 200 mg at bedtime for a period of 3 to 6 months, with careful monitoring of any side effects, may be effective.

Clients with suicidal depression should be given tricyclics in no more than 7-day quantities, because tricyclics, if used in an overdose, are extremely toxic, producing seizures and cardiac arrhythmias.

Lithium carbonate has been particularly effective as a treatment modality for individuals with affective disorders, including manic depressive illness, unipolar mania, and some unipolar endogenous depression. Insomnia associated with underlying mood disorders resolves as the mood disturbance is brought under control. To benefit from lithium therapy, the individual must be reliable in taking the daily dosage, and lithium blood levels must be monitored and titrated to levels of 0.5 to 1.0 milliequivalents per liter by careful adjustment of the daily dosage. Clients with suicidal depression should be given the medication in no more than weekly quantities because of its high toxicity when taken in overdose quantities. As with the use of tricyclic antidepressants, lithium is most effective when used in conjunction with psychotherapy, and if needed, residential placement.

The phenothiazines, chlorpromazine (Thorazine), trifluoperazine hydrochloride (Stelazine), fluphenazine hydrochloride (Prolixin), e.g., as well as other antipsychotics, haloperidol (Haldol), are sometimes effective in treating thought disorders which are either precipitated by drug use, or masked by heavy drug abuse. Antipsychotics should generally not be used in the crisis intervention phase, because of the possibility of idiosyncratic reactions and additive effects with the drugs the client may have taken. Phenothiazines should not be used where sedative-hypnotic withdrawal is suspected to be the precipitant of psychosis, as they lower the seizure threshold. If preexisting psychopathology of a psychotic variety must be managed in individuals withdrawing from sedative-hypnotics, haloperidol (Haldol) can be used for management of psychosis, and the sedative-hypnotic withdrawal should proceed at half the usual rate. Finally, antipsychotic medication is rarely necessary in the treatment of amphetamine-induced psychosis, as the thought disorder clears quickly upon cessation of amphetamine use, and the premature usage may obscure the diagnosis of psychiatric disturbances not related to amphetamine usage. For psychoticlike symptoms which emerge with the ingestion of hallucinogenic substances, excessive doses of amphetamines, or PCP, the best therapy is nonpharmacological, supportive custodial care, and removal of the individual from an overstimulating environment.

For the clients who manifest thought disorders in the postdetoxification period, antipsychotic medication is generally effective in both eliminating the psychotic symptoms and in alleviating the anxiety which the client was attempting to medicate. Again, drug maintenance on phenothiazines is effective only insofar as it is supported by other treatment modalities. If residential placement is required, the policy and attitude of the program toward antipsychotic medication should be explored, as many drug abuse treatment residential programs will not allow psychoactive drug use of any kind. Similarly, it is important that therapy be provided by a professional who supports the use of the medication. Finally, it is often helpful to have the drug administered on a daily basis during periods of crisis for clients who have difficulty taking the medication as directed.

BIOFEEDBACK

Biofeedback has received recent attention as a therapeutic modality for drug abuse. Several years ago, the San Francisco Polydrug Project began using biofeedback with polydrug abusers. We developed a number of impressions based on individual case studies. Because of changes in equipment and changing patterns of applications as we gained more experience in the technique, we have not used consistent procedures and we therefore emphasize the impressionistic nature of our own results.

With biofeedback, physiological functions such as electrical activity of muscles, hand temperature, or brain waves, are electronically measured and electrically processed to convert the measured signal to an auditory or visual signal which can be perceived by the patient. The most widely known form of biofeedback is the electroencephalogram (EEG), in which the frequency and amplitude of brain waves are processed electronically to detect frequencies in the range of 8-13 Hz, commonly known as alpha waves. Electromyography (EMG) converts muscle electrical activity to a tone which is proportional to the amount of muscle electrical activity. The individual attempts to reduce muscle activity by altering the tone. Positive results have been substantiated with tension headaches (Blanchard and Young 1974). With temperature biofeedback, the individual's temperature (usually measured by a thermistor on the fingers) is made proportional to a tone. As anxiety and unpleasant emotions activate the limbic system of the brain with consequent vascular constriction, teaching the individual to warm his/her hands is a method of teaching control of anxiety. In addition, temperature biofeedback is used for treatment of migraine headaches. Other physiological functions can be used for biofeedback treatment but are not as common as the three just described.

Biofeedback has two distinct kinds of therapeutic effects. When used with a client who abuses analgesics because of episodes of migraine, biofeedback may have specific effects (Taub 1977). Successful training can result in a reduction of the frequency and/or intensity of migraine headaches, thus limiting or removing the symptom for which the analgesics were abused. A similar effect is observed in individuals who use drugs to self-medicate anxiety. As symptoms are brought under control, the individual has less need for sedatives. Biofeedback training also has nonspecific effects as well as placebo effects (Miller and Dworkin 1977). The knowledge that the individual is able to acquire control over his/her physiological processes is frequently of importance in increasing the individual's self-esteem and feelings of mastery over his/her environment. We believe this control to be of great importance to an individual who has relinquished control of his/her feeling states and physiology to drugs.

Biofeedback probably has its greatest application in the later phases (3 and 4) of treatment. Biofeedback should not be introduced so early in treatment that the client is unable to be successful. Failure only increases feelings of hopelessness and further lowers the individual's self-esteem. Individuals who are in crisis or undergoing the stresses of withdrawal have difficulties in learning control. EMG is generally the easiest modality to learn and can sometimes be useful during withdrawal in reducing muscle tension.

To achieve maximum therapeutic benefit, biofeedback sessions should be given daily for 30 to 50 minutes each. The patient may acquire physiological control with a few sessions. However, additional practice and use of other feedback modalities can be helpful. Clients should be encouraged during biofeedback sessions to express their feelings about the various sensations they experience while learning control. Such expression allows input from the staff which can circumvent the client's feelings of displeasure or discomfort. For example, stimulant users often have an idea of relaxation different from decreased muscle tension. Some may report the feeling of reduced muscle tension to be an unpleasant state and they may describe it in terms of being "dead" or "sleepy." Such sensations can be interpreted by staff as a change in psychological state which will pass as they continue to use the equipment.

Like psychotherapy, regular biofeedback sessions maintain regular contact with the client. The newness of the procedure and the impressive equipment may serve to mobilize hope and may exert prominent placebo effects (Shapiro 1971). While biofeedback alone is insufficient therapy for the majority of patients, the modality may have some role in the therapy of many patients. The goal of biofeedback is the acquisition of physiological control, and its utilization has been successful when the patient acquires control. Psychotherapy and biofeedback are frequently complementary. Biofeedback serves to build self-esteem, a feeling of mastery, and the acquisition of nondrug control-of-feeling states. Psychotherapy, on the other hand, can serve to modify human interactions—a change which cannot be acquired through biofeedback.

CONCLUSIONS

Comprehensive treatment of polydrug abusers generally requires the strategic use of a variety of treatment modalities and techniques. The use of a particular modality is most effective when consideration is given to the needs of a particular client and to the appropriate timing of a given intervention. We have presented a conceptual framework illustrating a range of possible intervention techniques which can be adapted to the client's needs. The treatment plan of an individual who has become involved in destructive use of drugs should be thought through in a methodical manner, and adequate time should be allowed the individual to successfully work through each phase of treatment. Perhaps the biggest obstacle to successful treatment is our own need to produce a "quick cure," whereby we allow ourselves to be seduced into the short-term gratification model shared by all drug abusers.

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13. Vocational Rehabilitation

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INTRODUCTION

There appears to be general agreement that employment represents a significant part of the drug abuse rehabilitation process. With increasing frequency, policymakers are acknowledging the importance of employment (Domestic Council Drug Abuse Task Force 1975; Strategy Council on Drug Abuse 1976; the President's Message on Drug Abuse 1977). Treatment standards require the provision of vocational rehabilitation services (U.S. Office of the President 1975; Joint Commission on Accreditation of Hospitals 1975); researchers consider employment an important outcome measure; treatment providers consider it an important service (Goldenberg 1972; Mandell et al. 1973); and clients indicate that it is an essential element of their rehabilitation (Goldenberg 1972; Mandell et al. 1973).

A review of national statistics of clients enrolled in federally funded treatment reveals that in 1975, 74 percent of clients leaving treatment were unemployed. The 1976 data reflect a similar problem—73 percent of clients leaving treatment were unemployed (NIDA 1975-76). There is evidence that suggests some explanations for this poor showing on employment. Employment services are often not provided by the clinics (Goldenberg 1972; Mandell et al. 1973; Hubbard, in press). Where services are being provided, there has been very limited overall success, as well as confusion as to the exact nature of the services provided and who is providing them (Goldenberg 1972; Mandell et al. 1973; Burt 1976; Sells 1974). Vocational and educational services are frequently unavailable to ex-addicts in the community (Ward 1973; Domestic Council 1975; Drug Abuse Council 1973), and many ex-addict clients have limited work skills or experience and lack realistic vocational goals (Sells 1974).

Is there a relationship between employment and long-term rehabilitation? Is there a relationship between employment-related counseling and services and overall improvement in psychosocial functioning? Studies indicate that those who secure employment or training are more likely to complete treatment than those who remain unemployed (Sells 1974; NIDA 1975-76; Bass and Woodward 1978). A number of studies seem to suggest that during the program the recipients of employment-related services have a higher employment rate, higher legitimate income, less time incarcerated (Bass and Woodward, 1978; VERA 1975), and more positive attitudes toward society (Bass and Woodward 1978) than similar treatment clients not receiving employment services. However, little is known about the nature of these relationships.

A thorough review of the literature reveals that the few controlled studies in the area of vocational rehabilitation that exist have focused on employment outcomes but have not examined the relationships mentioned above (VERA 1975; Koenigsberg and Royster 1975; Bass and Woodward 1978). The integration of vocational rehabilitation in treatment (with a few exceptions), the value of different service delivery models, and the effectiveness of the various service components for different client populations have not been subjected to rigorous study. At the same time, the literature contains a growing number of reports on clinicians' experiences in delivering vocational rehabilitation services.

What is Vocational Rehabilitation?

Vocational rehabilitation is a process in which the client is helped to understand his/her problems and strengths, and is provided with services which will help him/her become employable and obtain and hold a job. This employment may be full time or part time, or may be work as a homemaker.

Since no one treatment program can provide all of the necessary services, vocational rehabilitation practice relies heavily upon referral procedures to existing community resources (Domestic Council Drug Abuse Task Force 1975). This requires a coordinated effort, including a working knowledge of vocational counseling skills in order to accurately evaluate client needs and support their movement through the referral system; a working knowledge of community resources; and a current acuity to the labor market, its trends, requirements for inclusion, and demands (Moore et al. 1976).

Why Do Many Drug Abusers Need Vocational Services?

Anecdotal reports from clinic personnel state that many of the residual problems of addiction, such as a lowered self-esteem, prison records, a history of addiction, poor education, limited vocational skills, and poor employment records are major obstacles to employment. Almost as disabling as addiction itself is the stigma that a history of addiction leaves with the ex-addict. The public's image of the ex-addict further hinders reintegration.

Where Does Vocational Rehabilitation Fit Into Treatment Programs?

Ira Goldenberg, in a study of attitudes toward job training, counseling, placement, and followup among drug counselors and employers in Boston (1972), found that only 15 percent of the 166 programs he surveyed used employment-related services. However, 89 percent of the programs he surveyed stated that ". . . jobs were the answer to the addiction problem and that the availability of good non-dead-end jobs was a significant factor in rehabilitation."

However, the responsibility for providing general counseling and employment-related services in most drug programs rests with the counselor who coordinates all of the treatment procedures necessary for the addict's rehabilitation. Counselors for the most part are untrained for their jobs, most learning on the job. Goldenberg reports that two-thirds of staff time focused on counseling with regard to matters unrelated to employment. In studying community resources for drug and alcohol abusers in Los Angeles, it was found that job counseling is not among the 10 services offered; however, it is one of the 3 most demanded and one of the 6 most wanted (Ries et al. 1972).

A study in progress for the National Institute on Drug Abuse (NIDA) explores the types of vocational rehabilitation services provided to clients in a random sample of 200 federally funded treatment programs. It was learned that about one-third of clinics funded by NIDA did not report that vocational or employment counseling were provided in the program. About 12 percent did not even provide such counseling services to their clients through referrals to other agencies. In most clinics surveyed, few resources had been committed to vocational services; in over 50 percent of the clinics, no budget for such services could be identified. Less than 20 percent of the clinics had staff identified as responsible for vocational rehabilitation counseling or job development. In most instances, such activities were considered the responsibility of the general counselors, along with all their other duties (Hubbard, in press).

In some treatment programs, however, vocational specialists do exist and are represented by a variety of backgrounds including: vocational rehabilitation professionals, manpower specialists, employment specialists, job developers, and clinic counselors trained to provide vocational services to the clients.

What Vocational Services Are Being Provided?

The vocational rehabilitation services that have been provided with widely varying degrees of continuity and intensity, either in-house or on referral, seem to fall into 10 categories. To date, these have not been objectified as to their effectiveness.

1. The development of a written vocational plan (Wolkstein and Richman 1975).

2. An individualized assessment to include a review of the client's motivation, degree to which the client is realistic about him/herself as a worker, what s/he can expect from a job, what his/her goals are, and what obstacles to employment exist for the individual (Pittel 1973; Goldenberg 1972; Sanford and Rubino 1973).

3. The determination of short-term and long-term goals to direct the delivery of services, whether they are to continue vocational counseling, referral to an educational program, a sheltered workshop to develop employment skills, a skills training program, or job placement (Wolkstein and Richman 1975; Moore et al. 1976; Gordon 1977).

4. Ongoing vocational counseling to focus on encouraging client movement, directing and coordinating service delivery, and providing support and followup (Sanford and Rubino 1973; Ries et al. 1972).

5. Training to focus on remedial education, academic and vocational skills, either in-house, as often exists in residential programs, or on referral (Hubbard, in press).

6. A referral procedure to secure services such as academic and vocational training, deemed necessary as a means of helping clients meet goals and return to the community (Moore et al. 1976).

7. Readiness assessment to emphasize the need to prepare the client for employment to avoid either a rejection or a failure to hold a job because the placement was premature. Readiness involves both psychological and attitudinal issues as well as skill achievement (Dole and Wolkstein 1974).

8. Job development to focus on creating new jobs or facilitating the consideration of a client or group of clients as potential employees (Graham 1973; Ward 1973).

9. Job placement to prepare the client for a specific job, finding the job openings, preparing the employer to consider the client, and effecting a referral (Goldenberg 1972; Koenigsberg and Royster 1975; Carpenter 1976).

10. Followup (aftercare) to maintain continuity with the client and the employer and provide for intervention should problems arise.

What Is the Employment Perspective?

Work for an individual is a means of establishing personal and financial security and assimilation back into the community. In our society, who you are is often synonymous with what you do. Reports suggest addicts with good work histories and high prior earnings secure their own jobs without the direct intervention of the treatment program (Koenigsberg and Royster 1975).

There are, however, many clients who request assistance in securing employment and are, therefore, the ones confronted with the myriad barriers presented by the business community. Ward (1973) and the New York Temporary State Commission to Evaluate the Drug Laws (1973) have documented well the problems encountered by ex-addicts seeking services or employment in the community. They range from blatant discrimination to eligibility criteria that would have the effect of disqualifying any individuals with drug or offender histories.

Centralized job development and placement agencies for ex-addicts have been found helpful in developing liaisons between the treatment community and employers. The units seem best able to help black male clients between 20 and 40 years of age who were stabilized in treatment and had moderately good work histories, but who had not held more than entry-level jobs. Studies suggest that employers welcome a unit which acts to screen clients for job-readiness and qualifications for specific jobs, and which is available to provide assistance if problems develop with employees (Koenigsberg and Royster 1975; MARDA 1975). Those employers who have agreed to participate in ex-addict hiring efforts seem to be favorably impressed with their ex-addict employees. They reported having had confused and inaccurate prior information about drug addiction prior to contact with the units. Those who eventually hired ex-addicts found their overall performance as equal to, if not better than, their average employees (Koenigsberg and Royster 1975).

The issue of whether or not to tell the truth about one's background confronts most addicts interested in securing employment. Goldenberg (1972), in surveying employers, reported that 85 percent of them said they would not hire an addict. At the same time, 76 percent had developed elaborate medical examinations, security checks, bonding and licensing requirements, and lengthy personnel forms which were obstacles to those who want to conceal their past. Companies with more open policies tended to be manufacturing concerns with large numbers of low-skill, high-turnover production jobs (Koenigsberg and Royster 1975).

A number of reports, manuals, and studies have been prepared which provide guidance to employers on the hiring of ex-addicts (Noblit 1975; NIDA 1977). These generally provide suggestions for dealing with community treatment programs, the establishment of model employee drug abuse health benefit plans, and policies and practices for the hiring of ex-addicts. They provide a summary of the rehabilitation process and guidance as to appropriate and helpful information for an employer to seek when considering an ex-addict for employment.

The VERA Institute in New York offers a model for providing a supported work experience to ex-addicts as a transition from treatment to regular employment. It was established to test the effects of supported work on people with limited skills, poor work histories, and resistance to traditional manpower efforts. Studies show that participants earn more than the control group, work longer hours, and receive less welfare benefits than the control group clients not provided with supported work (VERA 1975).

Legal remedies have begun to be used to address the issue of employment discrimination. An employment discrimination suit was brought against the New York City Transit Authority whose policy excluded from employment any individual with a history of drug addiction or currently in methadone maintenance treatment. Expert testimony was presented on the ability of methadone maintained individuals to perform, and the policy was declared unconstitutional in a landmark opinion by Judge Griesa in the U.S. District Court (Griesa 1975). Based on this case and others, a manual has been prepared for treatment program counselors with suggested means for handling potential employment discrimination cases (Legal Action Center 1977).

Federal regulations now provide an additional technique for challenging discrimination (by recipients of federal funds) against qualified handicapped individuals, including addicts. Section 503 of the Rehabilitation Act of 1973 prohibits discrimination on the part of Federal contractors, and Section 504 applies to all other recipients of Federal funds.

What Are The Implications for the Future?

Implications for use of community resources. With the emerging climate of support for guaranteeing ex-addicts access to services and employment opportunities, it is important that service providers and ex-addicts take advantage of the community employment resources available through the State educational and vocational rehabilitation (VR) agencies and through Concentrated Employment and Training Act (CETA) funded training programs. Often all that is needed is creative interpretation of program regulations and guidelines. For example, to qualify for vocational rehabilitation services, a client must be found "disabled"; and to take advantage of some of the affirmative action programs, individuals must be found "handicapped." Many addicts in treatment could be found qualified for assistance under all these programs.

The guidelines for CETA and VR programs frequently specify target groups such as youth, women, handicapped minorities, low-income individuals, ex-offenders, or welfare mothers. Many ex-addicts fit into one or more of these categories. Often, treatment staff overlook the fact that clients may qualify for services as members of disadvantaged or handicapped target groups other than as ex-addicts. Simultaneously, the treatment community can, by advocating inclusion of the ex-addict, educate community agencies to see the ex-addict in a broader perspective.

Implications for training. There appears to be an urgent need for more onsite training and technical assistance for treatment program staff on basic vocational rehabilitation counseling, job development and job placement techniques, and on the utilization of community resources.

This would be a response to the counselor's frustration at often being expected to directly provide or support the delivery of vocational services without the necessary orientation and skills. It would help staff respond more appropriately to the expectations of clients, program administrators, and funding agencies. It should also result in better integration of vocational rehabilitation services as a basic component of the treatment process.

Suggested models for providing training to upgrade the vocational counseling skill of treatment staff might include: utilizing a professional vocational counselor (either from existing staff or a consultant) to provide an intensive inservice training program with a mechanism for followup; sponsoring the attendance of selected counselors at designated local or national vocational counseling training seminars and workshops; cooperating with the State vocational rehabilitation agency or local VR training programs to provide a comprehensive short-term internal or external training program.

Training should also be provided to the staff of the community agencies on how to work with treatment program clients and how to relate to the drug treatment community. Employers would also benefit from guidance on the selection, hiring, retention, and promotion of ex-addicts. Treatment programs should be involved in such training efforts in order to increase their knowledge of the needs and functions of community agencies and employers.

Implications for research. To understand better the employment needs and progress of clients in treatment, employment data should be collected and analyzed so as to be comparable to studies of the employment of the general public and special populations. Community labor markets, unemployment rates, and clients' skills and pretreatment employment patterns should be considered when establishing realistic national and local employment goals. Further employment studies should focus on such details as career patterns and levels of employment in order to better understand the employability of the ex-addict over time, ways in which ex-addicts seek and obtain their own jobs, and means of achieving direct negotiations with industries to place ex-addicts without stigmatizing the employee as an ex-addict.

Studies are needed to understand which model(s) for delivering employment services to clients is (are) most effective for different treatment modalities: the placement of a full-time professional vocational rehabilitation counselor or employment specialist on the staff of a treatment program; the hiring of a professional vocational specialist to act as a consultant to existing treatment program staff; the provision of training in rudimentary vocational rehabilitation counseling techniques to paraprofessional treatment counselors; the assignment of a counselor from the State vocational rehabilitation agency to a treatment program on a part-time or full-time basis; and the development of formal referral arrangements with local vocational rehabilitation and employment resources. It is also important to determine which vocational services are appropriate for differing client problems.

The relationship of employment to long-term rehabilitation and of unemployment to continued drug use needs to be further explored since herein lies the ultimate effect of vocational services.

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14. Aftercare in Drug Abuse Programing

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Over the past decade workers in the fields of mental health, alcoholism, and criminal justice have placed increasing emphasis on aftercare efforts in order to maintain clients problem-free in the community. Aftercare, or continuing care as it is sometimes called, has come to embrace many of those community interventions designed to permit the client's effective integration/reintegration into society. As will become clear below, those efforts may be organized by treatment programs, by community agencies, by various citizen groups, or by the clients/former clients themselves. Regardless of the actors involved, aftercare efforts are seen as being either a "last step" in the treatment process, or as a step that postdates formal treatment focusing on the client's community and on the client's ability to relate effectively to that community.

Aftercare then becomes an important addition to the treatment process such that the client is aided to make use of newly acquired coping skills in adapting to his/her community. Whether the client has been enrolled in an outpatient or residential setting, efforts to change client perceptions and behaviors will have been based very largely in the treatment setting. Community resources supportive of the client's changed lifestyle will need to be located and/or developed on his/her behalf. The client will have had no, or at best limited, experience in dealing with his/her surroundings in other than an antisocial manner. Moreover, various members of the client's community will have had limited opportunity to view him/her as anyone other than a drug user and thief/prostitute/hustler. There is little reason to expect the community's perceptions or expectations to change rapidly. More importantly, there is little reason to believe the client can assume and/or maintain the unfamiliar roles of stable employee, or responsible family member, or student either rapidly or with ease. It is here that aftercare efforts are seen as useful if not essential. Such efforts may involve intercession to obtain a variety of essential services, e.g., housing, legal aid, educational assistance, family aid, veterans' or welfare benefits, employment, etc.

Aftercare activities can be viewed, too, as a first line of defense against return to drug use. In this regard, supportive aspects of aftercare become of particular concern. The continuing display of interest in the individual's activities in his/her community and continuing support for prosocial activities after discharge from the treatment setting can then aid the individual to remain drug free in the community.

There has developed a rather considerable aftercare literature in mental health, regarding newly developed techniques (cf. Scoles and Fine 1971; Sanders et al. 1967; Conference Report 1976; Donlon and Rada 1976; Zusman 1972; Katkin et al. 1975; Fairweather et al. 1969; Weinman et al. 1970; Stein et al. 1975) as well as a number of studies attesting to the utility of those efforts using hospital readmission rates as a criterion of effectiveness (Zolik et al. 1968; Beard et al. 1963; Anthony et al. 1972; Purvis and Miskimins 1970; Hogarty et al. 1973, 1974a, 1974b; Wolkon et al. 1971). However, other studies in mental health have not found the same relationship of aftercare to lowered recidivism (Byers et al. 1976; Pishkin and Bradshaw 1960; Franklin et al. 1975; Vitale and Steinbach 1965). There is somewhat larger agreement on the relationship between retention of the client in the community and efforts to develop the client's family as a social support system (Mannino and Shore 1974; Kowaleski 1972; Freeman and Simmons 1963).

A more modest aftercare literature has been acquired in the sister fields of alcoholism (cf. Ozarin and Witkin 1975; Intagliata 1976; Pokorny et al. 1973; Pittman and Tate 1969; Cantanzaro and Green 1970; Davidson 1976) and criminal justice (cf. Mandel 1971; Gardner 1973; Seddon 1975; Brown and Schuman 1974, Dye and Sansouci 1974; Jeffery and Woolpert 1974).

However, with the possible exception of vocational rehabilitation, considerably less has been written regarding aftercare initiatives in the field of drug abuse. This situation exists in spite of expressed concerns that addict clients in particular are often ill-equipped to cope with societal demands as a consequence of their inadequate education (Waldorf 1971), limited vocational skills (Nurco 1973), and/or inappropriate patterns of socialization (Pittel 1974; Freudenberger and Pittel 1977; Chein et al. [illegible]).[1]

Why then has there been relatively little report of aftercare strategies developed in the drug abuse field? While no single answer may suffice, several possibilities suggest themselves. On the one hand, the drug abuse field does not find itself facing issues of deinstitutionalization, i.e., the effort to return clients to the community from residential settings, as do both mental health and criminal justice. In drug abuse, 85 percent of clients are seen in outpatient settings. While an increased effort to promote client integration into the prosocial community may be seen as warranted, there is not the gulf between institution and community that exists in other fields. Moreover, the drug abuse field has made substantial use of selected community resources. A recent study found that 33 percent of all service providers are persons volunteering their time (National Institute on Drug Abuse 1976). Nonetheless, it would appear that, for the most part, these volunteers work with clients in treatment settings rather than in the community.

It has also been hypothesized that of all aftercare initiatives, vocational rehabilitation is of the largest consequence to the integration/reintegration of drug abuse clients and thereby comes to be far more heavily emphasized than other community intervention efforts (Pittel 1976). Indeed, there are data to suggest that both clients and staff consider vocational rehabilitation and employment to be of particular significance for client rehabilitation (Goldenberg and Keatinge 1973; Perkins and Wolkstein 1973).

It has also been reasoned that methadone programs, both maintenance and detoxification, view heroin addiction as a recurring illness and therefore emphasize clients' ability to return to treatment (Sells 1977), permitting a lessened concern with aspects of aftercare. The use of ex-addict counselors in drug abuse treatment has permitted counseling staffs to be seen by clients as more knowledgeable about both drug abuse and the client condition (LoSciuto and Aiken 1978), but may in some instances have resulted in a use of counseling staff who have, themselves, had only limited opportunity to develop skills useful to negotiating all aspects of the extra-treatment community. Finally, the tradition of counseling/psychiatric treatment is one which emphasizes the development of coping skills through an inclinic emphasis on exploration of self and understanding of one's strengths and weaknesses, rather than one which encourages entry into the community with and for the drug abuse client.

Nonetheless, significant beginnings have been made in the field of aftercare, and the remainder of this paper will be devoted to an exploration of models developed in drug abuse and related health fields. The initiatives described will be categorized by service provider. As indicated above, the several intervention types to be explored are: (a) self-help efforts, (b) efforts organized by the service delivery community, and (c) efforts organized by nonprofessional and university groups.

SELF-HELP GROUPS

Like aftercare, the self-help movement, as both primary treatment and aftercare, has become a major force over the past decade. Self-help efforts have been characterized in terms of purpose and composition (Caplan 1974; Levy 1976; Lieberman and Bond 1976; Sagarin 1969; Killilea 1976; Ishiyama 1977). Self-help groups as they are involved in aftercare can be described as involving group support in the interest of maintaining changed behavior together with some lesser emphasis on continued individual growth and change.

Specific activities that have been described as undertaken by self-help groups and that may be seen as relevant to aftercare fall within the helper-therapy principle whereby the individual is enabled to maintain/change a selected identity by helping other persons (Reissman 1965; Katz 1970; Gartner and Reissman 1977). In fulfilling that helper role, individual groups members are called upon (a) to adhere to simple statements of principles; (b) to attend regular as opposed to episodic meetings; (c) to affirm and reaffirm their commitment to personal change/maintenance and group solidarity, and (d) to make use of principles of will, inspiration, and/or demand for action (Gartner and Reissman 1977). Levy (1976, 1977) notes that self-help groups focus directly on members' behaviors. He states that verbal support for appropriate behaviors is an expected part of group functioning, that advice or training is frequently offered regarding the monitoring of behavior and recognition of danger signs in the self, that modeling is available through the mechanism of individual descriptions of success in overcoming shared difficulties as well as suggestions for facing life problems. Overriding all is the use of a new and supportive group of individuals whose behaviors are viewed as separating them from the mainstream of society (Madsen 1974; Bender 1971; Mowrer 1972; Katz and Bender 1976; Bachman 1971) and whose needs may have been poorly served by the traditional service delivery system (Steinman and Traunstein 1976; Silverman and Murrow 1976; Leach 1973).

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[1] It is noteworthy that several of these authors emphasize that the client is not without coping skills but assert that those skills have been developed for use in negotiating an antisocial environment.

The field of drug abuse has witnessed a massive growth of self-help efforts in terms of the development of the therapeutic community movement (Johnson and Cressey 1973; Ishiyama 1977),[2] and has seen far more modest activity specific to the development of self-help groups in the area of aftercare. Narcotics Anonymous (NA) is a national organization reported to have 700 chapters although total membership is unknown.[3] Like Alcoholics Anonymous (AA), NA views itself as both a primary treatment resource and aftercare modality servicing "recovered addicts." It, too, makes use of 12 traditions directing group activity and a 12-step approach for the individual emphasizing faith, a recognition of one's inability to exercise appropriate controls, reliance on the will and power of God, an inventory of oneself and one's personal shortcomings, a development of positive interpersonal relationships, and a sharing of one's spiritual awakening and behavioral change with others. Meetings are described as "conducted by recovered addicts for addicts" (Narcotics Anonymous 1977), although all types of drug abusers are welcome. Like many other self-help organizations, NA is seen as owing its origin, more than 25 years ago, to the efforts of a single charismatic figure (Sagarin 1969) identified as Danny Carlsen.

A concern that has emerged in the field of alcoholism, and that is voiced in the field of drug abuse, is that the self-help group will appeal most largely to middle-class individuals and have limited lower class membership (Madsen 1974; Bailey 1965). It has also been reported that various minority groups are little represented in various self-help efforts (Nurco 1978). There is a concern, too, that the drug abuse client—and most particularly the addict client—is little used to functioning in formally organized groups outside treatment settings. In this context, it is interesting to note Ch'ien's (1977) report of alumni associations in Hong Kong organized by him and now embracing 1,200 dues-paying former opiate users. It should be noted that the Hong Kong alumni associations are made up overwhelmingly of older recovered addicts (50+ years of age) and, unlike NA, maintain a close, if not symbiotic, relationship with traditional drug treatment programs.

Self-help groups may also be made up of the families of individuals showing disturbance. Families Anonymous is a national organization initiated in 1971 to aid families in coping with situations created by drug abuse (Families Anonymous 1971). It is comprised of 100 chapters, and like its sister organization Al-Anon, it too makes use of 12 steps to guide members' behavior. Families Anonymous has come to include family members with children having behavioral problems other than drug abuse but has remained deeply invested in its first concern. Families Anonymous was not developed as an aftercare organization; however, in strengthening the capacities of its members, Families Anonymous may enable family members to provide more effective (realistic) support to the problem relative. Families Anonymous has as its major theme a shifting of emphasis by the participant from the child to the self as a person who legitimately has his/her own difficulties. Families Anonymous attempts to relieve family members' guilt and anxiety and enable them to find help for the drug abuser outside the family and deal realistically with the problem of drug abuse.

As evidenced by the work of Ch'ien, self-help groups need be neither spontaneous nor dependent on charisma. Moreover, Ch'ien's work also illustrates that professional workers may aid in the formation and development of self-help initiatives. While self-help groups tend to be viewed as the province of the nonprofessional, several authors have pointed to the roles that professionals can and do play in support of self-help activities. Gartner and Reissman (1977) indicate that professionals have initiated such organizations, consulted to self-help groups, provided training and backup support to participants, referred exiting clients to self-help, and acted as spokespersons for various groups. They caution only that professionals not co-opt, romanticize, or seize on self-help as an alternative to other needed services.

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[2] Synanon, Daytop, and Delancy Street are cited as treatment initiatives that follow the self-help model (Gartner and Reissman 1977).

[3] By comparison Alcoholics Anonymous (AA) in 1975 was reported to consist of 26,967 chapters and a membership of 578,000. Alcoholics Anonymous is now said to exceed 750,000 members (Gartner and Reissman 1977).

Gartner and Reissman caution, too, that self-help groups be rigorously evaluated and that client satisfaction not become the sole criterion of effectiveness. In part, since many self-help groups lay heavy emphasis on client anonymity, it has been difficult to obtain effective assessment of their impact. Reports with regard to the effectiveness of AA have been enthusiastic (Madsen 1974; Maxwell 1962; Leach 1973), but have been either heavily anecdotal in nature or have used nonrepresentative samples.

THE SERVICE DELIVERY COMMUNITY

Particular advantages have been seen as attached to efforts by the treatment program to provide aftercare services. Lamb (1977) points out that a relationship already exists between staff and client; staff has had ample opportunity to develop a knowledge of client strengths and weaknesses and therefore is in a good position to follow through on aftercare recommendations. Such efforts by treatment staff may include activities to reestablish the client with his/her family, to establish or reestablish employment and/or schooling for the client, to obtain housing, legal services, licensure, child care, income benefits, etc., as a part of the client's community integration/reintegration. A technique that has been used in mental health programing is that of having counseling staff enter the community at routine intervals to review progress and problems with the discharged client (Pasamanick et al. 1967; Kris 1963, May 1975, Chien and Cole 1973).

In some instances clients have been placed in group living situations (Lamb 1977) and regularly visited in those settings. This model has been adopted by one drug abuse program serving drug abuse clients aged 17 to 20 who are unable to return to their homes of origin[4]. Clients at this program hold the lease and assume full responsibility for their own room and board. They meet weekly with staff and fellow residents in support groups. In a related program, Kantor et al. (1974) describe a program in which a complex of former mental health, alcohol, and addict clients were provided housing and given continuous support through the efforts of occupational therapist staff.

Treatment staff can also make effort to coordinate the work of other community agencies to support the client in his/her efforts to develop coping skills appropriate to a prosocial lifestyle. Efforts to organize and coordinate community services on behalf of drug abuse and other clients have been described by Pittel (1977), Fisher et al. (1973), Gottesfeld (1976), and Gittelman (1974).

As suggested above, the largest investment in aftercare services for drug abuse clients is in the area of vocational rehabilitation. Of particular significance here has been the effort to develop supported work programs (Friedman 1978; Manpower Demonstration Research Corporation 1976). In those programs, addict-clients are referred to stable work groups composed of fellow clients which permit graduated responsibility-taking by employees together with a graduated wage structure. Initial findings from controlled studies of supported work programs show supported work clients establish better employment records and permit a cautious optimism regarding this approach.

The techniques described above involve the investment of treatment staff in the client's community in an effort to modify that community and/or the client's relationship to his/her community. An alternative approach that has been adopted is that of encouraging former clients to maintain an involvement with the drug abuse program. In these instances, program graduates are urged to return to the treatment setting and may consult with other graduates both socially and in time of personal difficulty (Lennard and Allen 1973), thus lending each other a support similar to that available through self-help groups.

Finally, it should be noted that a variety of actors other than clinic staff can work with the client in both the treatment setting and the community in an effort to aid client prosocial functioning. Public health nurses have been involved in various mental health programs to conduct home visits following client reentry into the community (Ahmed and Young 1974) as have undergraduate college volunteers (Brown and Ishiyama 1968) and housewives (Sanders et al. 1967; Weinman 1970). However, such use of volunteers has not met with uniform success (Watson et al. 1975). Efforts by volunteers to provide aftercare services to drug abuse clients will be considered within the context of nonprofessional providers.

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[4] Kenneth Tarabelli 1976: personal communication.

THE NONPROFESSIONAL COMMUNITY

Building on successful experience in the use of companionship therapy with probationers (Ku et al. 1975), work has been initiated by Wolfe (1978) with addict-clients. In this effort, clients stabilized on methadone are matched with nondrug-using volunteers from the community in terms of personal interests and selected demographic characteristics, e.g., residential area, age, sex, ethnicity, marital status, and number of children. Volunteers are carefully screened with a view toward obtaining stable, accepting, and practical individuals. The volunteer meets with his/her client at least weekly and together the two involve themselves in varying community activities. The volunteer is given a modest stipend to permit some recreational activity as well as to cover costs of transportation. In this program it is hoped that the client may adopt the volunteer as a role model and will, at least, learn from the volunteer behaviors appropriate to a changed role in the community. While results are not available from the companionship program for drug abuse clients, results from the probationer program indicate a markedly lower rate of criminal recidivism among persons in the volunteer program as compared to regular probationers (Harshbarger 1977).

Wolfe's (1978) experiences regarding the willingness and/or ability of various community groups to volunteer their time to his project is also instructive. As might be expected, community organizations, e.g., block clubs, neighborhood housing centers, and community action programs were major sources of volunteer recruitment, although black male volunteers were generally difficult to obtain. In addition, project staff had considerable success in recruiting students from the university. By way of contrast, the industrial community is viewed as restricting its interest to alcoholism treatment, while church groups were described as responding cautiously to dangers seen as potential in an involvement with drug abusers, and fraternal organizations typically were described as involved with already selected pet service projects.

Within the area of voluntary organizations, the ACTION program with its several components[5] has been cited as of particular potential to drug abuse treatment generally and to aftercare efforts specifically (Wolfe 1978; Pittel 1977). Such volunteers could be available for companionship programs and for the development of alumni groups, as well as for work with youth in need of tutoring or of supportive role models. Indeed, the ACTION program is already invested in drug abuse treatment efforts in several communities.

ADVOCACY ORGANIZATIONS

No review of efforts to promote rehabilitation through the use of community intervention would be complete without a consideration of the role played by advocacy programs. Aftercare need not be limited to efforts to increase resources/supports for the client or to changing only those portions of the community most directly involved with the client, i.e. his/her work situation, family, housing, etc. It can involve efforts to remove existing societal barriers to the integration/reintegration of former drug abuse clients, considering such individuals as unnecessarily and inappropriately disavantaged and/or discriminated against.

Significant activities by the Legal Action Center have led to the overturning of policies forbidding the hiring of persons making use of methadone in treatment (NIDA 1975) and to the development of a manual to aid program staff counter discriminatory hiring practices directed against drug abuse clients (NIDA 1977). Further efforts are concerned with practices regarding licensure, housing, welfare, and insurance benefits, etc.

IMPLICATIONS FOR TREATMENT

If it is accepted with Lennard and Allen (1973) that drug abuse treatment, to be effective, must make significant effort to "change the social context in which the addict is located," several possibilities suggest themselves. Within the self-help area, alumni associations may be explored for their potential to support client efforts to cope with their communities. Three avenues suggest themselves. Affiliation with the Narcotics Anonymous network and Families Anonymous is a resource for appropriate clients and their families. As a second avenue, Alcoholics Anonymous is available to persons who have experienced difficulty with alcohol and nonalcoholic drugs and is sometimes available to persons who have been nonalcohol drug users only. In selected communities AA has been willing to expand its scope to embrace all substance users. A similar organization, Focal, developed in Washington, D.C., provides support to all graduates of a substance abuse treatment program serving both drug and alcohol abusers. Finally, program administrators can make the effort to stimulate the development of self-help groups in association with their own programs as has been done so successfully by Ch'ien (1977).

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[5] ACTION is made up of the following domestic volunteer programs. Volunteers in Service to America (VISTA), University Year for Action, Retired Senior Volunteer Program (RSVP), Foster Grandparent Program (FGP), Senior Companion Program (SCP), National Student Volunteer Program (NSVP), and the Youth Challenge Program (YCP).

With regard to activities undertaken wholly by treatment personnel, staff can involve themselves more largely in efforts to enter the community to explore with the client efforts to cope with his/her community and to help obtain any needed services. In this regard, it has been suggested that the increased use of LAAM will lead to lessened in-clinic counseling as the client no longer need attend program daily, thus allowing staff more time to work with the client in his/her community. It seems likely that the nature and—just as importantly—the extent of any such staff/client interaction in the community will require negotiation to guarantee that the client feel supported rather than simply under continuing surveillance.

Finally, exploration can be made of the use of volunteers in aftercare programing. Groups that may be particularly worthy of exploration would appear to be college students, existing volunteer organizations, and community associations, as well as the ACTION program.

IMPLICATIONS FOR TRAINING

Efforts to encourage clients' prosocial adjustment to the community by attempts to modify that community and/or the client in the community would appear to call for skills and behaviors different from those demanded in normal clinic functioning. In the training of volunteers, both role playing and didactic exercises have been employed to prepare the volunteer for a role in the community. The development of similar training initiatives would be appropriate for efforts designed to permit staff to underake these new roles.

IMPLICATIONS FOR RESEARCH

As a first step, it would be important to assess client needs regarding integration/reintegration into the community and to explore those needs in relation to the community resources available. The extent of use by clients of those resources and services and the impediments to that use under normative circumstances will need to be explored.

In terms of the differing kinds of aftercare interventions potential, several studies suggest themselves. Inasmuch as there is no research with regard to the functioning and efficacy of self-help groups for drug abuse, it would seem appropriate to undertake various exploratory efforts with regard to this issue. The case study approach might be used to understand issues in the initiation, development, and maintenance of self-help groups. In terms of the initiation and development of self-help groups, the following issues might be addressed:

- What roles, if any, professionals play in the development of self-help efforts and if those roles change over time;
- The characteristics of nonprofessional initiators of self-help efforts, activities undertaken in developing groups, and impediments to be overcome;
- How self-help efforts relate to existing drug abuse treatment programs and other community agencies;
- The characteristics of individuals drawn to self-help groups, and pathways those individuals follow to enter self-help groups;
- Activities necessary to maintain the self-help group as a functioning body.

It would also be useful to explore the process and roles that are developed in those self-help groups that deal with behavior problems that are in some ways comparable to drug abuse, e.g., other forms of substance abuse, criminal behavior, other addictive and/or dependency behaviors.

Study could also be made of the advantages/disadvantages of using program staff as opposed to using community volunteers in the provision of aftercare services. The roles and activities undertaken by each group as a part of aftercare activities could be explored as well as clients' perceptions of each. In addition, the roles and activities of differing volunteer providers, e.g., university students as opposed to representatives of voluntary organizations, could be addressed.

Finally, as differing programs are developed, it will be essential to assess the impact of efforts initiated. In this regard, the use of self-help groups with their emphasis on anonymity may provide special research problems. Nonetheless, the need to understand the utility of differing interventions as compared to traditional programing is apparent. In addition, understanding the impact of aftercare programing on other aspects of the service delivery system, particularly the drug abuse program, and on the roles and functioning of staff of those programs will be of significance to effecting useful long-term liaisons between those differing systems.

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15. Drug and Alcohol Treatment

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Effective treatment of alcoholism and substance abuse has become of increasing concern, since studies published in scientific journals and emphasis in the media have sensitized the public to the hazards associated with the consumption of mood-altering agents. As amply documented in other chapters, the extent of use of these agents by our society does indeed seem to be impressive.

Statistics pertaining to consumption of these drugs, however, especially those considered to be "illicit," do not address the question of the need for more effective therapeutic approaches. A good part of the consumption of alcohol and some mood-altering drugs may be serving a useful purpose rather than being detrimental to health. What is relevant is the number of persons using such substances to an extent that results in either an interference in daily functioning or actual dependency, or the appearance of medical or social complications associated with such use. In these instances, therapy is clearly warranted. The direction of the therapeutic approach and its effectiveness, however, remain less clear. The purpose of this paper is to summarize existing knowledge about drug and alcohol therapy in an attempt to provide suggestions for further direction in treatment research. It is important to place the topic in perspective by considering what is known about the extent of drug dependence, the relevance to therapy of knowledge of psychodynamics and basic pharmacologic mechanisms, and the effectiveness of existing therapeutic models. The first two areas are discussed in considerable detail in other chapters. For this reason, only those aspects considered essential to an understanding of the effectiveness of existing therapeutic models will be highlighted.

DEFINING THE PROBLEM

Epidemiologic studies of alcohol and substance abuse can be divided into those utilizing aggregate data from multiple sources and those relating to specific well-defined population groups within a narrow geographic setting.

The major difficulty inherent in any large comprehensive study utilizing aggregate data is the considerable variability in data collection from individual centers. Surveys dealing with well-defined population groups, although somewhat smaller in sample size, are therefore of particular importance to both the uniformity and meaningfulness of data gathering. When such studies are reviewed, markedly different figures are reported. With respect to concomitant use of alcohol and heroin, anywhere from 25 percent to 80 percent of heroin addicts are found to consume a considerable quantity of alcohol on a regular basis, with up to 25 percent noted to be overtly alcoholic (Barr et al. 1976; Brown et al. 1973; Perkins and Block 1970; Rosen et al. 1975). Excessive use of alcohol in methadone programs has also been shown to be considerable, with prevalence rates of problem drinking ranging from 12 percent to 40 percent and alcoholism noted in 4 percent to 7 percent (Bihari 1974; Liebson et al. 1973; Scott et al. 1973; Schut et al. 1973).

Even those studies displaying a greater uniformity in data gathering still suffer from considerable deficiencies. Definitions used for the terms "problem drinking" and "alcoholism" vary. In almost all cases the absence of control groups does not allow a determination as to whether the characteristics observed in these selected groups are any different from those in the general population. The existence of control groups becomes essential in trying to define populations at higher risk for development of alcoholism. As an example, it is commonly believed that alcoholism is not only considerably higher among persons in methadone maintenance, but the hypothesis exists that methadone per se causes alcoholism. Yet several surveys of inner-city residents with comparable demographic characteristics revealed problem drinking in 20 percent to 48 percent of individuals (Preble and Miller 1977, Knupfer 1967; Robins and Guze 1976). Populations at higher risk, such as heroin addicts and felons, have evidenced a similar high prevalence. These findings suggest that a causal hypothesis between alcoholism and methadone maintenance is invalid. Despite all of the publications describing this relationship, however, few have been designed to allow for any meaningful conclusions.

Why are these epidemiologic studies relevant to treatment? First, a clear definition of the magnitude of the problem may allow for a better allocation of the available resources. Second, knowledge of comparative demographic data becomes of singular importance in trying to develop effective treatment approaches that will appeal to individuals within specific population groups. Third, comparison of rates of alcohol and drug dependence based on demographic differences may also help in identifying factors that may explain why some groups have a lower prevalence of substance abuse which may be helpful in modifying existing treatment modalities. Finally, an adequate assessment of the prevalence of polydrug abuse will allow for a redirection of the therapeutic effort which at present is concentrated in a "single substance" approach.

BASIC MECHANISMS INVOLVED IN ALCOHOLISM AND SUBSTANCE ABUSE

Psychosocial Factors

Numerous psychological studies have been published concerning the psychodynamics of alcohol and substance abuse (Barr et al. 1976, Dudley et al. 1974, Kissen 1973, Stanton 1977). It should be noted, however, that despite the volume of the literature, considerable disagreement exists not only with respect to the psychodynamics of drug abuse but also as to the meaning and operational measurement of the concepts utilized. In general, most of these studies tend to emphasize an early disturbance in family interrelationships preceding any evidence of substance abuse. Dominance of one family member, usually the mother, is prominent, with a frequent disruption of the family constellation. There is an extremely high prevalence of substance abuse in one or both parents, usually alcohol or a tranquilizer, especially of those individuals who turn to alcohol or narcotic use. The user's childhood is far from happy, with his/her reaction toward the environment being variable. Heroin addicts are characterized as openly defiant and unable to tolerate frustration, whereas the alcoholic is described as a much more passive-aggressive and depressed person. There is no doubt that a blending of these two descriptions can occur, with dependent persons in either group displaying characteristics common to the other. Great difficulty usually exists in developing interpersonal relationships, preventing the development of identification with an individual able to become a healthy role model. If this background is combined with illicit use of drugs, socially deviant behavior develops, reinforced by the pleasurable effects afforded by the drug. Shortly, drug dependence becomes an integrated part of the personality.

Recognition of these psychological and sociological factors is essential in formulating a therapeutic approach. All too often therapy centers only on preventing drug abuse. In this context the drug becomes the culprit. Pharmacologic approaches, such as Antabuse, methadone, or narcotic antagonists, when used in isolation, serve only to address the immediate problem, and although they may be effective on a short-term basis, unless psychological and sociological factors are considered, long-term success is unlikely. This overemphasis on the acute stage of drug use may explain the frequent recidivism following detoxification from methadone or discontinuation of a narcotic antagonist or Antabuse. To date little attention has been devoted to this area.

Physiological Mechanisms

Much work has been published with respect to pharmacologic interactions between alcohol and the hypnotic and tranquilizing agents. The similar effects of alcohol and these drugs emphasize that therapy for alcoholism involving substitution with a sedative or tranquilizing drug merely shifts the dependence.

Exciting new investigative work has been forthcoming on narcotic dependency. For the first time, specific narcotic receptor sites have been located in the brain (Snyder 1977). Endogenous substances with morphinelike activity, termed endorphins and enkephalins, have been isolated (Goldstein 1976). These substances may play a role in the addictive process either through direct interaction with morphine at the receptor site or by action on cyclic nucleotides. The potential of these findings with respect to the biochemistry of narcotic dependency is great, but the relevance to therapy remains unclear.

Relatively little basic work exists on the interactions between alcohol and narcotic drugs. Experimentally, evidence has been presented to suggest a pharmacologic relationship between alcohol and opiates. In animals undergoing alcohol withdrawal, the acute administration of morphine results in suppression of alcohol-induced convulsions, lasting for a longer period than the ordinary time-course of the analgesic effect of the morphine (Blum et al. 1976). This finding suggests that the suppressive action of morphine is independent of the analgesic effect and may be due to specific interactions between the two drugs. Rats bred to ingest large quantities of morphine, however, have been found to drink more alcohol than control animals (Nichols 1967). Goenjian and Cummins (1976) found that methadone-fed mice evidenced neither an increased alcohol consumption nor alteration of pattern of drinking, compared to nonmethadone-maintained controls. In a more relevant clinical study of five subjects on methadone maintenace, Cushman et al. (1977) reported that acute "social use" of alcohol effected neither plasma methadone level nor the disappearance rate of alcohol from the blood stream. The paucity of laboratory studies involving interactions of alcohol with narcotic drugs is disturbing. Increased activity in this area may present the clinician with findings relevant to treatment of both these disorders.

THERAPEUTIC MODELS

There is no question that abstinence is the most desirable goal in treatment of dependence on any mood-altering substance. Unfortunately, with respect to drugs causing physical dependence, this goal is often very difficult to achieve. Although abstinence from alcohol may be an effective approach for some, it is clearly inappropriate for the entire alcoholic population. It has been estimated that of the 9 million alcoholics, only approximately 5 percent are members of Alcoholics Anonymous or other self-help groups. Even among the 5 percent, however, there are many unable to abide by the AA principles, or who cannot be reached. It is not at all unlikely that figures would be similar with respect to heroin dependency.

Little support has been given to providing well-designed, objective evaluation of effectiveness of the therapeutic modalities for treatment of alcoholism and heroin addiction. This absence of effective evaluation has in no way been accompanied by modesty on the part of persons engaged in therapy in advocating a particular treatment approach. This telescopic view is exemplified in the field of alcoholism, where almost all of the organized health care system is adamant in an "abstinent only" approach to therapy. Suggestions of controlled drinking are met not only with skepticism, which would certainly be warranted, but with an intense hostility. Opposition to controlled drinking is based on the total acceptance of the "loss of control" hypothesis: that initiation of any alcohol consumption by an alcoholic will result in a rapid progression to uncontrolled drinking and recurrent alcoholism.

Recently, evidence has appeared in the literature supporting the possibility of controlled drinking combined with behavioral modification as a successful approach to management of chronic alcoholism. Paredes et al. (1969) found that only 3 of 66 alcoholic patients exhibited a craving for additional drinks after they had taken "authorized drinks." Davies (1962), in a study of 793 excessive drinkers who were undergoing psychotherapy, noted that most of these individuals were able to maintain moderate social drinking patterns for up to 11 years. Similar findings have been found by other investigators in a review of isolated studies concerning the effectiveness of a controlled drinking approach (Mello 1972; Gerard and Saenger 1966; Pattison et al. 1968). Most of these studies suffer from serious deficiencies in experimental design. The work of Sobel and Sobel (1976) is therefore of interest. These investigators randomly assigned alcoholics who qualified for controlled drinking to a behavior modification group with moderation in drinking as a goal, or to a traditional abstinence-oriented group. Outcome was assessed after a 2-year followup by a review of existing drinking patterns and various sociological indicators of adequate daily functioning. The controlled drinkers were found to function better than those in traditional therapy with respect to several indicators, including number of days abstinent from alcohol. These findings suggest that complete abstinence may not be a necessary or even a realistic goal in order to achieve social productiveness.

Hamburg (1975) has comprehensively reviewed the use of behavioral therapy for alcoholism. Identification of cues triggering excessive drinking, with subsequent education enabling the person to identify a situation with a high risk for drinking, has been found to be an effective therapeutic process.

The traditional abstinence-oriented approach through self-help groups and the use of disulfiram (Antabuse) in selected populations have long been the mainstay of therapy for alcoholism. The effectiveness of abstinence, disulfiram (Antabuse), and controlled drinking, with or without behavior therapy, as therapeutic modalities, however, has not really been adequately studied. There is almost no scientific evidence that would pass careful scrutiny supporting the superiority of any one of these therapies. Emerick (1975), in a review of 394 studies of psychologically oriented alcoholism treatment programs, showed that the difference in treatment methods did not significantly affect long-term outcome. In addition, the mean abstinence rates did not differ between treated and nontreated alcoholics. The most recent and also controversial study concerning the effects of different therapies for alcoholism was conducted by the Rand Corporation (Armor et al. 1976). This survey followed a sample of 1,320 alcoholics for up to 18 months after entering treatment programs. The relapse rate to alcoholism was no higher among those who drank occasionally than in those who attempted a totally abstinent approach. Persons who applied for but never came in for treatment had a 50 percent remission rate, with formal treatment, regardless of type, adding 20 percent to 25 percent to the overall remission rate. Once again this was a retrospective analysis using aggregate data from numerous treatment centers, making generalizations based on these findings quite hazardous.

It is also possible that the specific therapy is not as important as the availability of multiple approaches for individuals unable to be treated effectively in a particular setting. Kissen (1972) found the rate of successful therapy to be directly correlated with the number of therapeutic modalities available, rather than with a specific approach. Those patients treated with three available techniques were more successful than those treated with only two, who in turn had a more successful outcome than those offered only one type of therapy. The advantages of a multimodality approach certainly require further study.

Combined Therapy for Alcoholism and Narcotic Abuse

There is even less available information with respect to effective treatment for combined alcohol-narcotic dependency. One of the greatest difficulties to overcome in establishing a combined treatment facility for the alcoholic and narcotic dependent person is the prevailing attitude of staff at single treatment units. Alcohol counselors are extremely hesitant to admit the often aggressive, manipulative narcotic addict for fear that the existing therapeutic milieu will be irreparably damaged. Therapists in methadone programs may often fear that the alcoholic patients will serve to encourage a greater consumption of alcohol by those on methadone.

This problem is further complicated by the increasingly frequent phenomenon of the presence of a combined alcohol-narcotic dependency, especially visible in methadone programs. The alcoholic, methadone-maintained person presents a particular therapeutic problem as traditional alcohol treatment facilities strive toward abstinence from all drugs as their immediate goal. Although alcoholics on methadone maintenance may be accepted by abstinence-oriented groups subsequent to detoxification from methadone, most patients, remembering the hazards of illicit heroin use, are unwilling to become detoxified in order to enter this therapeutic setting.

The advantages of treating individuals with a combined alcohol and narcotic dependency or with individual dependencies within one facility have only recently surfaced in the literature. This is not surprising, as the personalities of the alcoholic and the narcotic addict differ considerably. The alcoholic is usually considered a passive-aggressive, depressed individual who in the therapeutic setting is often guileful and contrite, appearing to have strong motivation to resolve the drinking problem. The heroin addict, in contrast, appears manipulative and quite aggressive. A combined program for treatment of both dependencies theoretically might offer mutual advantages. The alcoholic could benefit from exposure to the younger, more active narcotic addict, and the aggressiveness and hostility of the heroin user might be moderated by exposure to the dampening effect of the alcoholic patient. Unfortunately, this benefit has not been realized. Often the alcoholic considers the behavior of the narcotic addict impulsive and boisterous. This arouses anger and resentment not only among the alcoholics but also, as discussed above, in treatment staff.

Ottenberg and Rosen (1971), in a review of 1½ years of combined therapy of 484 alcoholics and 201 heroin addicts, found, however, that the initial divisiveness between the two groups eventually gave way to successful therapeutic efforts. The retention rate of alcoholics in joint treatment was 59 percent as compared to 56 percent in preceding years, suggesting the absence of any adverse effects from remaining in this therapeutic milieu.

Another fairly large study concerning combined treatment of alcoholism and drug abuse was performed by the Veterans Administration (Baker et al. 1977). A 2-year review of data in 10 combined treatment units, 7 alcohol treatment programs, and 7 drug dependence treatment programs revealed all 3 treatment settings to produce sizable improvements in enrolled patients 6 months after discharge. The outcome measures of those treated in a combined setting were somewhat less favorable than those of alcoholics and/or drug addicts treated with conventional therapies. However, no large differences were identified, and the clinical relevance of these differences remains unclear. Unfortunately, both of these studies suffered from serious methodological deficiencies in that a prospective randomization of patients into either combined or individual treatment groups did not occur.

SUMMARY

In summary, there is an increasing awareness of the importance of effective therapy for alcohol and drug dependence. However, the effectiveness of existing therapies remains to be determined. In considering approaches that would be most helpful in improving upon therapy, the following issues should be addressed:

(1) Defining the actual prevalence of dependency to two or more mood-altering substances. Careful research is needed on focused population groups. These studies should have well-defined goals and objectives, with required data obtained directly from the subject rather than from a retrospective record review.

(2) Establishing funding for basic research to better define the basis of alcohol-narcotic interactions on a biological level. The possible role of endorphins and enkephalins in clinical dependency needs to be fully explored.

(3) Establishing effective protocols to objectively evaluate adequacy of existing therapy for drug and/or alcohol abuse. Demonstration projects should be funded only if adequate evaluative mechanisms, such as randomization and the presence of control groups, are included in the study design.

(4) Encouraging innovative therapeutic approaches, such as controlled drinking or behavioral therapy, only when adequate experimental design has been demonstrated. Such studies must also contain mechanisms for followup on a long-term basis rather than at 6 month to 1-year intervals.

(5) Supporting feasibility studies for combined treatment of alcohol and narcotic dependency in accordance with the above-mentioned guidelines.

It is anticipated that the recent biological advances in cellular actions of mood-altering drugs, combined with the institution of well-designed prospective studies evaluating effectiveness of therapy, will allow for a more holistic approach to treatment of drug and alcohol dependency. This will result in the treatment of the person rather than providing a telescopic therapy intent only upon eliminating the "offending drug."

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16. Job-Based Alcohol and Drug Abuse Programs: Recent Program Developments and Research

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INTERVENTION STRATEGY

Job-based alcoholism and drug abuse programs use specific strategies in an effort to prevent and treat substance abuse among employees. The most essential element of their strategy is the "constructive confrontation" of employees whose job performance has been deteriorating. Supervisors are encouraged to meet face to face with the employee whose performance has been impaired to confront him or her with the detailed facts about the employee's poor performance. The confrontation is combined with offers of whatever health and counseling services may be available from union and company sources, including a description of the alcoholism or drug abuse program.

Should performance continue to deteriorate, additional confrontations occur with increasing stress on the strategy of "crisis precipitation." That is, in a context of constructive offers of help, supervision informs the employee that job penalties and losses will occur should performance continue impaired. Each of these encounters repeats the listing of rehabilitative opportunities available, including description of the alcoholism and drug abuse programs, and an emphasis on the employee's right to choose to make use of them or not.

Behind these concrete supervisory actions lies a specific policy, usually written and circulated throughout the company, that contains basic themes. These are—

1. The behaviors called alcoholism and drug abuse constitute a treatable health problem rather than a moral weakness;

2. Impaired job performance and much human suffering result from this health problem;

3. In an effort to reduce these, management should simultaneously confront the employee face to face with his/her poor performance and offer him/her constructive, positive organizational support for treatment and rehabilitation;

4. If performance remains impaired, disciplinary measures should be introduced so as to precipitate a crisis in the employee's life;

5. These intervention strategies assume the full support of both unions and management;

6. To carry out the policy intent, close working relationships with relevant community agencies must be developed; and

7. Other types of employee problems may emerge from a use of the policy, and these should be managed in much the same way.

These policies consistently underscore that it is the employee's option to choose whatever methods he or she wishes to regain normal performance, either using the company program, or on his/her own efforts. If, however, work performance does not improve, an effort will be made to precipitate a crisis in the employee's life by placing the matter within the disciplinary policies that cover poor performance. This tactic, however, will be used only after reasonable confrontations and offers of support for treatment fail to obtain results. To protect union prerogatives, job security and promotion rights often remain intact during efforts to motivate the employee to regain satisfactory work performance. Furthermore, in unionized companies impaired performance is defined within the framework of collective bargaining contracts and agreements.

Policy execution, however, depends largely upon the action of immediate supervisors. It is they who will detect deteriorating performance; it is they, in conjunction with union representatives, who will engage in discussions with the poor performer designed to motivate and inform the problem employee about his/her opportunities to use treatment resources both in the plant and in the community, if he or she chooses.

CURRENT STATE-OF-THE ART IN INDUSTRIAL PROGRAMS

The general strategy spread slowly but surely during the 1960s until 1970, when well over a hundred corporations had such policies in operation. Since the early 1970s this number has dramatically increased, yet still totals no more than three or four hundred among the larger manufacturing companies, banks, utilities, merchandising, transportation, and life insurance companies. If programs in small companies, consortia of small firms, and union-initiated programs are added, the total number of well-implemented programs in the country is probably no more than 600.

On the optimistic side, however, is the substantial magnitude of the increase in the establishment of job-based programs when a concerted effort was made to encourage them by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and other groups such as the National Council on Alcoholism (NCA) in the early and middle seventies. Moreover, this was a first concerted effort, characterized by haste, crippling ignorance of the work place, and low priority in Federal funds. Despite these and other handicaps, a remarkable increase in extant programs occurred. More importantly a climate and a momentum have been established in the industrial and business community and in the labor sector that promise a readiness on the part of many employers and unions to explore, initiate, and put such programs into practice.

Furthermore, the resistance among top management and union leaders that was anticipated in the sixties proved to be an exaggeration. Rather there is an unfamiliarity, an apathy, but not an explicit well-defined rejection of the basic themes of such policies. In other recent instances unions seem to be taking the initiative in initiating programs themselves—another optimistic sign.

All things considered, it is a strategy whose "time has come" in terms of readiness within the industrial world to learn about it, but whose high promise could easily fade unless future efforts reduce the glaring flaws of the past few years and continue realistic efforts over a sufficient period of time to determine their effectiveness.

TYPES OF INDUSTRIAL PROGRAMS AND THEIR SUCCESS

As job-based programs have spread in numbers they have also taken different forms. Originally, in the 1940s, 50s and 60s, they were directed primarily at alcoholism, in some instances so narrowly that the program scarcely dealt with the plethora of ailments and disorders that accompanied alcoholism. This narrow type was, fortunately, infrequent, and most early programs were pragmatic enough to deal with such obvious associated problems as nutritional deficiencies and liver damage. They could be called "primarily alcoholism programs."

As emphasis on the impaired-job-performance theme grew, it became obvious that job impairment could result from difficulties other than drinking behavior, and that these narrow programs needed to widen the focus of their interventions. Consequently, programs came to include the many ramifications of alcoholism: marital discord, financial disarray, digestive and respiratory disorders, and an entire panoply of psychiatric problems, such as compulsive and psychoneurotic behaviors, that often accompany alcoholism. These can be called "expanded alcoholism programs."

A third type of industrial program emerged as the use of other mood-altering drugs became more widespread and popular during the mid-sixties and late sixties. Company-based programs then became "alcohol and other drugs programs." Increasingly they dealt with the multiple abuse of alcohol, tranquilizers, and amphetamines, for example, or the youthful employees who combine marihuana and wine in their drug abuse. These programs appropriately could be called "substance abuse" programs.

By the mid-seventies many programs, both new and old, were calling themselves "troubled employee" programs—a fourth type of program. Although their central thrust was still alcoholism and drug abuse, they attempted to deal with a wide array of employee "troubles" interpersonal conflicts, severe alienation, phobias of all types, depressions, and sexual difficulties, as well as substance abuse and alcoholism. Because of their wide scope, they have recently been termed "employee assistance programs."

Efforts to gauge the success of these various types of job-based interventions have been confined almost entirely to evaluation of the first two types of programs, namely those with a central focus on alcoholism. Although a variety of studies purport to evaluate the success of these programs, only five or six have respectable study designs. On the other hand, they are very consistent in their findings: the programs studied achieved very high success rates, often up to 75 percent 3 years or more after the treatment.

SPECIAL PROBLEMS OF INDUSTRIAL PROGRAMS

The genuine promise of these programs is, however, beset by numerous problems. These can be listed as follows:

(1) Probably the most pernicious problem can be termed "bypassing." This refers to those situations in which managers and shop stewards, in conjunction with treatment people, bypass the policy and its program and rush a drug-abusing employee directly into treatment, thereby losing the motivating power of constructive confrontation, and possibly creating premature labeling that could become a self-fulfilling prophecy.

(2) Programs have frequently neglected labor unions who represent employees in the workplace. This neglect has lost for job-based programs the combined intervention power of management and labor. It has provided the drug-abusing union member with an opportunity to play the union against management, and thereby protect his addiction. The neglect has deprived programs with ties to the community. Unions are community-based organizations. As such they provide opportunities to interface programs with family and treatment institutions.

(3) Historically, job-based programs have dealt predominantly with male alcohol and drug abusers. At the same time, women are entering the labor market in increasing numbers. Moreover, research indicates that women tend more often to be multiple drug abusers, and that their alcohol drinking patterns are beginning to approach those of males. Despite these trends, industrial programs have yet to make systematic efforts to adapt their strategies to female employees.

(4) Many programs are plagued by inadequate or sporadic efforts at implementation. For example, unfamiliarity with program content and policy by line managers and shop stewards is one of the biggest reasons for low policy use when occasions to use actually arise.

(5) Apathy in top management is a part of the implementation problem. Again, it is lack of familiarity with the programs that seems to lead to such apathy.

(6) Limited insurance coverage has hamstrung programs. Outpatient treatment is often sharply restricted in the number of hospital visits allowed—a real problem for industrial programs. Also, many insurance companies completely exclude alcoholism, and if it is covered, the insurance often excludes specialized treatment centers and limits length of stay.

(7) Consistently, programs have failed to use their strategies on high-status persons, such as executives, professionals, and highly skilled employees (Trice and Beyer 1977).

(8) Managers and union officials often express deep concern about assurances of confidentiality in the execution of a program because of the involvement of numerous persons and the potential for lasting stigma that could result.

(9) Lastly, the ability of line managers to analyze and confront poor performance varies widely, and often a supervisory reluctance to use the program produces a "policy-practice gap."

PREVENTION AND JOB-BASED PROGRAMS

Industrial programs offer preventive as well as treatment potential even though the latter has received the primary emphasis. That is, these programs may well produce a double "payoff." Confrontation may act to blunt the progression of one problem drinker into alcoholism, as well as provide an avenue for another employee to reach treatment.

Furthermore, these interventions come from very powerful institutions in the community—some observers believe the most powerful—namely the world of business, industry, commerce, unions, and occupations. Their power to intervene seems far more pervasive and potent than that present in family, medical, religious, and legal institutions today. In addition, this power is reinforced by a legitimacy not present in other community institutions. The right to intervene grows from the employer's right to expect reasonable, regular performance on the job. Since drug abuse impairs that performance, employers can intervene in the name of poor performance.

REVIEW OF PAST 5 YEARS; PROGRAM INITIATIVES

Recognition of Role of Labor Unions

The momentum to recognize the important role of unions, whose influence and power had been largely neglected in the past, began in the mid-sixties and late sixties, and accelerated during the past 5 years. This recognition, however, has been an uneven process in job-based programs for drug abusers. A parallel upsurge of interest in expanding alcoholism programs into "broad brush" ones that would include forms of drug dependencies other than alcoholism, even the many mental illnesses, caused much concern in many union circles. The central place of impaired job performance in most job-based programs also disturbed numerous union officials. In addition there was disagreement about efforts to write program provisions into labor-management contracts.

Two trends emerged from these union reactions. One was for the union, rather than management, to take the initiative in developing a program; for example, the longshoremen in New York City have done this and the New York Shippers Association has cooperated with them. The other was for unions to move toward joining with management in a common policy/program that centered on constructive confrontation, and on offers of rehabilitative support, but not based on impaired work performance. The Airline and Aerospace Workers of America-Machinists is an example. Both these trends contain a strong union emphasis on "achieving a well adjusted human being" (Perlis 1973) and not merely as a means to higher profits and lower absenteeism (Perlis 1974).

Entry and Development of Change Agents in Occupational Programing

A second prominent initiative of the past 5 years has been the emergence of change agents, both internal to the workplace and external to it. Both, however, were change agents in that their goal was to encourage, facilitate, and help implement the development of explicit drug-abuse policies and programs, especially for alcoholism. Unions tended to combine this function with actual counseling of problem-drinking employees; this was especially true of the enlargement of AFL-CIO community services counseling programs during the period. Since unions tend to be closer to family life than management, these efforts had a family-related tone and were less oriented to job impairment and poor performance than management-initiated policies/programs.

The period saw the emergence of substantially more full-time and part-time persons on company payrolls whose job was to facilitate and expedite a formal policy ("internal change agents"). Often these persons were attached to personnel departments; they tended to come from management or industrial relations backgrounds; and, when full-time, were likely to be recovered alcoholics. In contrast, many part-time facilitators helped implement policies, but also worked with other policies such as safety, health benefits, and equal employment opportunities. These were less often recovered alcoholics, but were typically attached to personnel departments. There were, however, numerous examples of formal attachment to medical departments, especially full-time program coordinators who were also considered to be "motivational counselors." In general, there was a mild tendency for all types of facilitators to deal with "troubled employee" programs, with an increasing awareness of the abuse of drugs other than alcohol. More characteristic of this development, however, was its recognition that a "policy" would become a "program" through tangible mechanisms for implementation. The program facilitator ("coordinator") illustrates this awareness and indicates that both companies and unions were making tangible efforts to move drug-abuse policies into actual practice.

The occupational-program consultant represents the outside change-agent type. Typically these persons are full-time and work for an alcoholism or drug abuse group that is community-based. Their major objective has usually been to encourage employers and unions to adopt and implement alcoholism and employee assistance programs. They do this as "outsiders" and consequently work with a wide variety of workplaces. The chief impetus for the emergence of these external change agents came from the Occupational Program Branch of NIAAA. It made available in the spring of 1973 to each of the States and territories 3-year demonstration grants of about $50,000 per year to be administered by the State to develop occupational program consultants. Although these grants have now expired, some individual States have incorporated these jobs into their overall efforts either through State tax moneys or fee-for-services through local agencies. A 3-year intensive study of occupational program consultant (OPC) efforts in one State (New York) revealed that the OPC statewide network had resulted in the establishment of numerous tentative beginnings, adoptions, and actual implementation of policies into functioning programs—substantially more than before the OPC effort (Coppes et al. 1977).

Unfortunately, the training for and development of these various change-agent roles have been spotty and generally ineffective. Despite the promise that these roles hold forth, they have yet to be adequately studied and training based on such studies uniformly mounted.

Employee-Assistance Programs and Drug Abuse

A third program initiative has been the rise of efforts to deal with a wide variety of employee problems—employment-assistance programs (EAP). Often these have been largely expansions of alcoholism programs to include abuse of other drugs, although there are those that focus more on emotional disturbances that are relatively free of drug abuse. One impetus for these programs has been the unprecedented entry of large numbers of women into the labor force and their tendency to be polydrug abusers (Trice, in press). This multiple-abuse pattern forces upon job-based programs a consideration of the impact of drugs other than alcohol upon job performance, and sensitizes program managers to seek appropriate treatment. Another impetus has been the continuing and mounting emphasis upon impaired job performance as the central ingredient triggering job-based programs (Roman and Trice 1975). Obviously poor performance can come from a wide variety of factors, both off and on the job. Consequently EAPs have attempted to embrace as many as possible. Since drug abuse has an impact on job performance (Trice and Roman 1972), it has been a logical target for inclusion.

One prominent exception, however, has been narcotic addiction. Not only have narcotic addicts, with prominent exceptions, tended to show antipathy toward work, but both drug treatment facilities (Hersey et al. 1975) and employers have shown an unwillingness to substantially aid narcotic dependent persons find work. Combined, these forces have made this type of drug abuser a job outcast who is difficult to include under the EAP umbrella.

A final pressure for EAPs has been the experience of line managers. They tend to encounter a variety of problem employees and so are apt to be receptive to a program that attempts to deal with more than alcoholism. Despite this inherent feature of supervision, EAPs typically report that alcohol abuse is the most frequent problem (Hilker et al. 1975). All things considered, however, drug abuse other than alcoholism is coming to be a part of the EAP movement in business and industry.

The U.S. Civil Service Alcoholism and Drug Abuse Program

Although numerous other large employers have adopted and begun to implement policies, the one launched by the executive branch of the Federal Government has probably received the most attention. It contains many of the prevailing practices and problems present in any policy/program effort (Trice et al. 1978; Beyer and Trice 1978). In addition, it has been the subject of congressional investigations, aided by the General Accounting Office, newspaper publicity, and discussions at professional society meetings. State and municipal employers have been interested in it as a possible model. Because Federal unions are of relatively recent origin, and many installations are not unionized, the policy is a testing ground for the impact of the union on policy implementation (Hunt 1977).

In addition, the policy was one of the significant provisions of the Hughes Act, namely that the Federal Government develop and implement a job-based alcoholism policy for its entire civilian work force. Since the U.S. Government is the largest single employer in the world, many viewed this development as a significant step in the spread of job-based programs. Evaluative data collected in 1974 showed that the implementation of the policy had many serious deficiencies. Despite these it was nonetheless functioning at approximately the level of many policies in the private sector, even though it had been in existence only 3 years at that time (Beyer and Trice, in press). Much of its success can be attributed to the support and pressure from unions in the Federal Government. Prominent among its flaws are unfamiliarity with it by line supervisors, and the lack of even modest resources to sustain the coordinators mandated by the policy.

Rising Interest in Program Evaluation and Research

Job-based programing has been characterized by a pragmatic action orientation and a neglect, even a dislike, of tightly designed research, including program evaluation. This traditional avoidance of data, and the neglect of the adequacy of research designs from which it comes, have declined noticeably during the past 5 years, especially during the last 2. This has been insufficient to overcome the dearth of respectable data, or to compensate for the unusually poor quality of much of the data that do exist.

Nonetheless, signs of change have appeared. Data-based papers have begun to appear in very recent years on the programs of the Alcohol and Drug Problems Association, the National Council on Alcoholism, and the Association of Labor Management Administrators and Consultants on Alcoholism (ALMACA.) Granted that these usually fail to reach the quality of research papers presented at behavioral science professional society meetings, they do, however, mark a shift in emphases.

This trend is particularly true of evaluative research pieces. No longer is it unpopular in "occupational programing" circles to ask the question: "I wonder how effective these polices really are?" Neither is it a source of stigma to express doubt that there may be some problems with the oft-repeated claim that such programs achieve 75 to 80 percent "success."

Illustrative of this trend were the well-attended, well-discussed research sections of all three of the groups mentioned above. For example, the ALMACA conference featured explicit sessions on research needs and evaluation studies. One highlight of these sessions was the circulation of a survey of research-oriented people concerning how to improve quality and attract research-oriented, and qualified, persons to the field.

REVIEW OF PAST 5 YEARS: RESEARCH ACTIVITIES

Recent research efforts can be divided into eight categories. Strictly speaking, the research data in any one of these are typically limited and the quality and amount vary widely. Nonetheless, a research orientation is beginning to emerge in job-based programing.

Studies of Efficacy of the Strategy of Constructive Confrontation

To what extent does the job-based strategy described above actually motivate alcohol- or drug-abusing employees to alter their behavior? How does the strategy compare with other intervention strategies? Despite numerous discussions in the literature, only a handful of studies can be put in this category: Smart (1974), Heyman (1976), and to a lesser degree Schramm (1976) and Asma et al. (1971). The strategy is supported in three out of four of these pieces, but in none was the research design sufficiently tight to reach more than tentative conclusions.

Evaluative Research Studies: Outcomes

Related to the studies just reviewed above are those that have attempted to determine the extent of desirable outcomes for employees who are processed through job-based programs. Hilker (1972) used a time-series design and compared data on job performance, sick absences, promotions, sobriety, and accidents 5 years before the program intervention and for 5 years after. He reports dramatic before-after differences, and concludes that these are evidence of program effectiveness. Unfortunately, he did not use comparison groups or otherwise control for competing hypotheses. Moberg (1974) attempted to introduce comparison groups. He compared employed persons entering an inpatient facility from companies with a program with those who came from companies without one. He reported no significant differences in terms of abstinence. A comprehensive analysis of a variety of other efforts appeared in 1975, (Edwards 1975) and a cost-benefit model has been proposed (Schramm 1975).

Studies of the Effectiveness of Program Implementation

Also evaluative in thrust, but with a sharply different focus, have been recent studies aimed at determining if, in fact, a "program" is actually in place and functioning. This concept argues that program outcome studies are much influenced by the extent to which the program is "fully" implemented. Also, proponents of such studies believe that such data can be fed back into the program to make it more implemented. Three studies of implementation of the program of the U.S. Civil Service Commission illustrate this category (Beyer and Trice, in press; Trice et al., in press; Trice and Beyer 1977). The data from these studies evaluate the extent of policy diffusion and resources, the degree of supervisory agreement, the effectiveness of alcoholism coordinators, the extent of union involvement, and actual policy use. The Commission's policy showed many serious flaws in implementation, but was minimally operative even though it was only 3 years old at the time of the study. One serious problem was its differential use of its policy at lower skill levels, and its neglect at high-status job levels. An informative survey of policies and how they may or may not be "programs" appeared in Hitchcock and Saunders (1976).

Studies of Drug Abuse and Employment

Research reports on drugs other than alcohol and the workplace have begun to appear. Although more indirect than those about alcohol, they are beginning to generate data that are genuinely job-related. A recent compilation of articles contains exploratory data that illustrate the trend (Scher 1973). Using survey techniques, Chambers and Heckman (1972) showed that numerous occupations had drug-abuse problems other than alcohol, and one study used a time series designed to generate data to show that a job-based program for drug abusers, using a drug-free criterion, could be effective (Hilker et al. 1975).

Two studies have generated sustained samples and provide systematic data (Hersey et al. 1975; Caplovitz 1976) about narcotic addicts. The first study, done in Boston and New York, contrasted drug-free and methadone programs relative to employment-related services for addicts. Their data suggested that drug-free programs provided more job-related services than the methadone maintenance ones. In addition, both types had relatively few capabilities to deal with employment problems and rehabilitation for employment. This situation was further described by data suggesting that employers remained adamant against employing persons with drug histories. Caplovitz (1976) focused on a highly relevant question in this regard. To what extent can narcotic addicts perform acceptably on the job? His data came from 500 working addicts who, for various reasons, came to be patients in methadone or drug-free treatment programs. To a reasonable degree these may represent the "hidden addict" who is probably working. The data suggest that many narcotic-dependent persons manage to hold jobs despite heavy drug use and considerable impairment of performance.

Epidemiology of Drug Abuse and Problem Drinking in Work Organizations

Research directed toward determining accurate estimates of the extent to which problem drinking, alcoholism, and drug abuse can be expected to be found in various types of work organizations began to appear. Studies in the military are the most extensive. Cahalan and Cisin (1975) applied survey techniques to uniformed naval personnel and found, for example, that among other things 19 percent of enlisted men and 9 percent of enlisted women had either "critical" or "very serious" consequences from their drinking within the prior 3 years. Robins (1974) found in a well-validated study of Army returnees that almost half of the men used some narcotic in Vietnam over a considerable period of time. About one-quarter used amphetamines or barbiturates and use of marihuana was very frequent. Upon return to the United States, however, levels of drug use declined to preservice levels, and the rate of addiction was quite low for a followup period of 2 years. A nationwide study of a sample of men aged 20 to 30 in 1974 showed that full-time employed males reported 12 percent less use of all drug types except alcohol, suggesting that a "regular job may serve as a restraining influence on the extent to which men use drugs, or that drug users are less likely to seek or find full-time employment" (O'Donnel et al. 1976). The prevalence of problem drinking among a sample of blue-collar workers in Baltimore showed substantial differences contrasted with a national sample (Siassi et al. 1973). Although the data showed this population to have more heavy drinkers than the national one, it had less "heavy escape" drinkers. The data from a second study of drinking patterns in specific jobs typically associated with problem drinking led to the conclusion that "some occupations seem to provide acceptance or encouragement of drinking patterns and problems which may not be encouraged or accepted elsewhere" (Hitz 1973). Also, drinking problems were far more common among "lower blue-collar" workers, a finding confirmed by other data (Trice and Beyer 1977). Finally, in sharp contrast to the prevailing estimates of 5 to 6 percent alcoholics in the labor market, a study of a national sample of over 500 executives in large, private business and industry disclosed that just less than 10 percent of them believed the prevalence in their organizations reached this proportion (Roman 1974). A quarter of them believed it to be less than 1 percent.

Research on Role of Unions

A recent review of existing data (Trice et al. 1977) concluded that numerous signs have appeared that suggest a more cooperative atmosphere between management and unions about various forms of drug abuse, especially alcoholism. At the same time the review revealed that the data were indeed sparse. Within the last half of 1977 three new sources of data have come to our attention. One study (Hunt 1977) showed that unions in the Federal Government played a prominent role in the policy implementation process. This study strongly suggests that much of the modest success that can be attributed to that program was due to union pressures and favorable impacts on line supervisors. Schramm (1977) traced the process whereby specific language about alcoholism is incorporated into labor-management contracts, and surveyed the wide range of provisions for disciplining and treating alcoholic employees. He concluded that both employers and unions, for a variety of reasons, are increasingly willing to develop collective bargaining language on alcoholism.

Steele (1976) and Steele and Smith (1976) have moved the focus to drug abuse rather than alcoholism. They contrasted the unsubstantiated perceptions about drug use and abuse presented in management literature with interview data from 300 leaders of organized labor in an industrialized city in the Midwest. The union leaders tended to agree with the management literature that an increase was experienced in the first half of the seventies, that drug users are young but not Vietnam veterans, and that less than a quarter of their companies had formal policies. They differed in that the union leaders believed drug problems exist at a higher rate, believed there are more dismissals because of them, and in that they knew less than management about existing policies.

Studies of Risk Factors

Trice and Roman (1972) discuss a variety of hypotheses about how characteristics of jobs and the workplace could place workers at a higher risk of alcohol and drug abuse. Reichman (1977) expanded these, concentrating on the degree of congruence between individual traits and job requirements in career development. Using matched pairs (alcoholic and nonalcoholic), he generated data that suggests alcoholism may be explained, in part, by low congruence during job careers. He further develops the hypothesis by means of exploratory data that tend to differentiate "late" from "early" alcoholics, and from nonalcoholics, at different points in their careers. Roman (1978) reports data collected from managers in Federal installations aimed at specifying those job characteristics present when supervisors identified a problem-drinking subordinate: interdependence of tasks, clarity of output goals, on-the-job mobility, and closeness of supervision. Two of these characteristics were particularly conducive to supervisory identification of deviant drinkers, namely where jobs were interdependent with one another and "work settings where employees are required to absent themselves frequently from a base office" (Roman 1978).

Change Agents and Job-Based Programs

Although much of the research is yet unpublished, there are systematic studies of occupational program consultants, who are "external" change agents, and program coordinators inside workplaces, who are also change agents. These throw considerable light on the functioning of these change agents. Beyer and Trice (in press) found that internal change agents in the form of alcoholism coordinators in Federal installations worked in settings where there was much dissension about the need for, and strategy of, the policy. They functioned best when the role was attached to a line supervisor who had considerable time to experience it, and who had reasonable resources for implementing it. Reports on the effectiveness of external change agents, i.e., OPCs in New York State, show that although they tended to neglect labor unions initially, they nonetheless had clearly influenced just over 40 percent of the 620 work organizations and unions contacted during the past 3 years (Coppess et al. 1977) and made inputs into the decisionmaking of another 12 percent. This influence ranged from such specific implementing acts as helping with policy writing to aiding inside coordinators to find appropriate community facilities. That is, they were, to a definite degree, involved in developing a "program" (Trice 1977).

IMPLICATIONS FOR THE FUTURE

Research

Although program evaluation studies have appeared, and the notion is currently salient, research designs have failed to go beyond time-series patterns. Undoubtedly randomized designs are very difficult, but comparison-group strategies may be feasible. Unless progress is made in reducing design problems, program evaluation will continue to be plagued by an inability to deal with competing hypotheses.

At bottom, these same problems must be faced in the rising tide of interest in cost-benefit approaches to program evaluation. Equally troublesome here is the ever-present problem of quantification of "benefits" and the tendency for funding sources to uncritically accept these types of studies. In and behind these problems lies the simple but difficult problem of the adequacy of workplace records, especially those dealing with work performance.

In addition, there is a clear need to develop reliable data about the workplace and drugs other than alcohol. Currently there is a sharp imbalance. Even though it is reasonable to believe that alcohol is the drug of major impact here, there are obviously impacts from other drugs and these need to be more thoroughly studied. The saliency of this need will probably mount because of the unprecedented flood of women into the labor market. Since they tend to be users and abusers of drugs other than alcohol—and of alcohol also—their multiple-drug use will probably force studies of multiple-drug abuse and the workplace.

Finally, a similar neglect of research on the role of unions is in the process of being corrected, but there is no assurance this research trend will continue. Obviously it is needed, since unions play a prominent role in a sizable portion of the workforce. Moreover, additional research on the role of the union would serve a badly needed larger emphasis, namely to evaluate the degree to which a program is truly "implemented."

Training

The implication for training is that practically nothing is known about training for persons who specialize in job-based policies/programs or who should use them, such as line supervisors and shop stewards. Although one (apparently the only one) study (Belasco and Trice 1970) utilized a rigorous research design in evaluating a variety of approaches to supervisory training about problem employees, it was confined to one work organization, and has not been replicated. It did, however, present data to support the position that training "to be a good supervisor" was more apt to produce use of a program than training narrowly directed at drug and alcohol abuse. This was especially true if general supervisory training was facilitated by the use of drug-abuse cases; these acted to put the supervisory process in bold relief, and it could be more easily studied. Such findings need to be tested on other work populations, and made more specific to the referral process. For example, union shop stewards need training for filling their role in jointly administered or union-only programs.

From what we do know come some deductions. First and foremost, the roles involved in job-based programs are unique to that milieu. Consequently, training must be heavily oriented to the nature and makeup of the work organization, and less so to aspects of alcohol and drug abuse per se. In the past, much training for these roles has been treatment-dominated, and thereby substantially off the target. Numerous persons have quite recently entered the field with only the most meager knowledge of job analysis, industrial training, union history and administration, personnel management, and organizational behavior and development. In short, training for them will of necessity need to be unique in the drug abuse and alcoholism worlds, without overlooking the nature of those severe health problems.

Moreover, it will need to be unusual for roles within the workplace. Line managers, for example, need to know how to deal with problems of defining poor performance. In contrast, internal policy facilitators need to know as much as possible about how to diffuse policy information and create familiarity within complex formal organizations. Those who are actually in counseling roles need to know the principles of that intervention technique, coming largely from counseling psychology and social work. Last, but not least, outside change agents such as OPCs need to understand how personnel and medical departments function within the larger work system, how to establish relations and rapport as an outsider, how to diagnose problems of policy implementation, and how to feed these back to inside program managers. For all of these roles, however, a basic orientation to the unique nature of the workplace is essential.

Treatment

Despite the lack of strictly compelling evidence, there are still good reasons to believe that job-based programs first and foremost act powerfully to motivate the drug- and alcohol-abusing employee to seek rehabilitation of some variety, and to remain in the treatment program long enough for therapists to secure significant results. Consequently, this potential will probably be recognized more and more in future. Accompanying this advantage, however, there is a danger. It is simply that treatment people will encourage a "bypassing" of the internal policy/program and thereby weaken, if not destroy, the motivating power present in them.

The opportunity to motivate is particularly great for female employees who are drug abusers. Many of them have been the "hidden" housewife who has joined the recent mass entry of women into the labor market. Once in a job, their abuses will be far more visible than before, and the opportunities for reaching them with treatment will increase markedly. Thus the future will be marked by an increasing need to determine not only how to adapt programs to employed women, but what kinds of treatment will fit the unique features they bring to drug abuse.

In this regard, they raise an implication for the future that applies to women and men as well: future programing will have to find ways to interface with treatment facilities so that appropriate referrals can be made. More use of outpatient facilities seems in order. Rather than drug and alcohol dependencies being thought of as "greater levelers," the realities of occupational status differences will have to be faced in making compatible referrals. Moreover, the liaison mechanisms between company, union, and treatment facility will have to be made more explicit. A development of liaison persons in both sectors, and their interchange, is already being examined. Questions of confidentiality, length of stay, insurance coverage, and the sharing of observations of job behavior and patient behavior must be answered and mechanisms organized.

Finally, the "reentry" problem is a very real one. Job-based programs imply that employees who go through them will get into some sort of treatment, and will return from that to work. There are in this process very real problems for maintaining the gains made while in treatment. One of the most pressing needs for the immediate future is to devise ways for management, union, and treatment facilities to explore how their program specialists can reduce the risks in the return to work.

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17. Innovative Treatments for Drug Addiction

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As early as 1876 Scientific American was commenting on "radical cures for the opium habit." Drug addiction is such a frustrating condition that, even now, novel treatments for it are continually being tried. Some of the new treatments have entered general use; most have been discarded. In this review we will critically evaluate some innovations in the treatment of addiction. Unfortunately, few of the clinical studies that will be discussed utilized proper methodology (random assignment, control groups, objective measures) and thus only tentative conclusions can be drawn.

THEORETICAL BASIS OF BEHAVIORAL TREATMENTS

The work of Abraham Wikler (1973) over the past 3 decades has called attention to the importance of conditioned responses in the addictive process. Drugs act as powerful forces in shaping behavior, both by their direct pleasant effects (positive reinforcement) and by their effects in relieving withdrawal symptoms (negative reinforcement). Wikler theorized that the environmental cues which have been repeatedly paired with drug-induced states may become conditioned stimuli. He observed that former addicts who are free of drugs often develop tearing and yawning (opiate withdrawal signs) when they discuss drugs in group therapy. He and others subsequently showed that withdrawal signs could become conditioned in animals (Wikler and Pescor 1967; Goldberg and Schuster 1967). More recently, conditioned withdrawal has been demonstrated in humans (O'Brien et al. 1975, O'Brien et al. 1977). These conditioned withdrawal responses are thought to be partly due to simple pairing of pharmacological withdrawal with environmental cues, and partly due to pairing of environmental stimuli with the body's homeostatic mechanisms adapting to the onset of drug effects (Wikler 1973; Siegel 1975). Eventually the environmental stimuli themselves can elicit the adaptative response and this can be perceived as withdrawal.

As a result of this conditioning former addicts may develop withdrawal symptoms when they return to the environment in which they had previously used drugs. Not only do they develop drug craving, but actual physical signs of sickness may occur (tearing, yawning, nausea, vomiting). There is also some evidence (Whitehead 1974; O'Brien 1975) that conditioned withdrawal can occur in patients maintained on a steady dose of methadone.

There are other conditioning factors which help to maintain self-administration of drugs. Addicts tend to use drugs in a ritualistic fashion. When the drug is administered, the withdrawal discomfort (both pharmacological and conditioned) is eased. At times, depending on the level of tolerance and dose of the drug used, the patient will feel euphoric. There is some controversy over how often a typical addict obtains euphoria rather than just relief of withdrawal distress (McAulliffe and Gordon 1974), but clearly the reward is intermittent. Since intermittent reinforcement is very effective in maintaining behavior, this may explain why self-administration can continue when street-heroin potency is low or when saline is substituted for opiate (O'Brien 1975). Addicts who report pleasure from self-injection of inactive substances have been termed "needle freaks" (Levine 1974). This phenomenon is usually seen only in "blind" conditions when the user expects a drug effect, but the substance administered actually contains little or no active drug. If addicts are informed that a substance is a placebo or if they know they are on an antagonist which will block drug effects, self-injection will stop after a few trials (Altman et al. 1976).

The existence of these conditioned phenomena requires that they be considered in the treatment of addiction. A number of innovative methods have been attempted which might influence conditioning or enable the patient to cope with conditioned withdrawal or conditioned drug craving.

COUNTERCONDITIONING PROCEDURES

Numerous published studies have described procedures to combat drug-taking behavior by aversive conditioning. These have been critically reviewed by Callner (1975). The reports consist of single cases or groups of cases, some with excellent results. While electrical and chemical aversion techniques are difficult to apply to typical addicts, the method of covert conditioning (Cautela 1975) has gained some acceptance.

Covert conditioning or sensitization consists of the use of imagined scenes as aversive events and as rewarding events. Beginning with the initial craving for drugs the patient is asked to imagine as clearly as possible each link in the chain of events leading to drug taking. Instead of pleasant drug effects, the patient is asked to imagine becoming severely ill in vivid terms as a consequence of the drug. When the patient imagines the avoidance of drugs he is told to imagine pleasant scenes. Covert sensitization has been successfully used in several published case reports or series of cases (Wisocki 1973; Cautela and Rosensteil 1975). It has been used in combination with other behavioral techniques (O'Brien et al. 1972), and it has been successfully augmented by hypnosis (Copemann 1977) and by chemical aversion (Maletzky 1974).

Implications

While controlled studies of covert sensitization have yet to be done, it is a treatment which may have practical value. It is a simple technique which can counter some drug-conditioned responses and produce new adaptive responses. Of course, it requires motivated patients who must cooperate fully with the therapist. It has been used as an adjunct to a therapeutic community (Copemann 1977). Covert sensitization may also be helpful in patients who have been maintained on methadone or LAAM and who are in the process of gradual detoxification. Another population likely to benefit would be those being treated by naltrexone.

EMG BIOFEEDBACK RELAXATION THERAPY

The use of electromyographic (EMG) biofeedback as an aid to teaching muscular relaxation has been used in several studies. Using surface electrodes, the muscle activity around the patient's forehead (frontalis muscle) is linked to a tone or a light giving the patient a measure of his muscle activity. Most patients can learn to achieve a state of marked relaxation within several sessions. Feedback of electroencephalogram (EEG) or skin temperature has also been used as an aid in learning the relaxation response.

Relaxation training adds a nonpharmacological coping device to the repertoire of drug abusers. When the patient is in a situation which usually evokes feelings of anxiety, tension, or drug craving, he can attempt to counter these dysphoric feelings with relaxation instead of a drug. Indeed, excellent results have been described by Goldberg et al. (1976) in a small series of patients being maintained on methadone. Using alpha training, all four subjects reported a decrease in illicit drug usage and an increased feeling of self-control. Lamontagne et al. (1975) also reported positive but less dramatic results among college students who used cannabis and occasional hallucinogenic drugs. Khatami et al. (1977) using EMG biofeedback and random assignment showed significant reduction in anxiety and depression scores and significantly less use of illegal drugs by methadone patients who participated in relaxation training. Six of 13 patients randomly assigned to relaxation training were early dropouts, however, and when these were included in the statistics, the experimental patients did better than control patients only on anxiety ratings. When the same investigators (Khatami 1978) repeated the study using "false" EMG biofeedback for the control group, both groups showed marked improvement over nonexperimental groups (demonstrating the power of "placebo" effects) but some significant differences between "true" and "false" biofeedback remained. The "true" biofeedback group showed greater improvement on anxiety and depression ratings and less opiate use at followup 1 month after completion of all treatment ($p < .05$). The "false" biofeedback group showed no advantages over the "true" biofeedback patients.

Biofeedback-mediated relaxation training has also been used as an aid to opiate detoxification. Cohen et al. (1977) found in an uncontrolled study that patients receiving biofeedback training during detoxification reported marked reductions in withdrawal discomfort. The patients gave strong testimonials to the benefits of biofeedback as an aid to opiate detoxification. These investigators, however, went on to conduct a controlled trial during detoxification using an elegant double-blind methodology for both EMG and EEG biofeedback. Under these conditions no differences between control and experimental populations could be demonstrated.

Implications

The relaxation response appears to be a logical method for teaching patients to cope with dysphoric feelings (both conditioned and pharmacological) in lieu of drug self-administration. While many patients report success with this method, control patients do almost as well while on methadone maintenance and just as well during opiate detoxification. This illustrates the strength of nonspecific factors such as attention and enthusiasm in producing excellent results with innovative treatments for drug abuse. Obviously these nonspecific or placebo factors must be controlled if treatment studies are to produce usable information.

CONTINGENCY MANAGEMENT STUDIES

Another approach to behavioral change among drug abusers has involved the identification of rewards and punishments in the patient's environment which can be therapeutically manipulated. In an inpatient program, Glicksman et al. (1971) set up a token economy system in which prisoner-addicts were able to earn points by participation in group therapy and educational programs. Accumulated points could be used to "buy" an early release. Although a controlled comparison with other wards and a followup were not conducted, the addicts in the token economy program showed greatly increased participation in therapeutic and educational activities. They also reported generalization to other socially desirable behaviors such as improved communication and decreased hostility.

In an outpatient methadone program, Stitzer et al. (1977) determined that "take home" doses were the most desired reinforcers. In 16 patients who resisted counseling sessions, they gave weekend take-home methadone, only when the counseling sessions were attended. In the contingent situation, counseling sessions increased significantly, but they returned nearly to baseline levels when take-home doses were awarded noncontingently. Similar results were obtained when absence of diazepam abuse or heroin abuse (as measured by urine testing) were used as the target behavior on which take-home methadone was made contingent (Bigelow et al., in press).

The use of methadone as a reinforcer has been used by Liebson et al. (1978) in the treatment of opiate addicts who are also alcoholics. Daily methadone dose was made contingent on the ingestion of disulfiram. Disulfiram is a nonrewarding drug when taken alone and it produces aversive consequences if alcohol is ingested along with it. Using this procedure, Liebson et al. reported a marked reduction in drinking behavior for contingently treated patients as compared to controls. There was no increase in dropouts from methadone therapy and no evidence of symptom substitution by the use of other drugs. There was also a trend toward greater employment among the contingent group. This method for alcoholic opiate addicts is currently being tested in a multiclinic collaborative study by the Veterans Administration (Ling et al. 1978). The latter methodology is double blind, comparing placebo plus methadone treatment to disulfiram plus methadone.

Copemann and Shaw (1976) studied in a residential treatment facility 21 addicts (mainly heroin) who had criminal charges pending. Avoidance of incarceration was made explicitly contingent on performance in treatment. No control group was included, but residents in the contingent group did significantly better than volunteers. Boudin et al. (1977) also used contingent management techniques in a mixed group of 19 drug abusers. A detailed contract was set up for each client and the investigators were both creative in discovering reinforcers and diligent in applying them. Good results during treatment and at followup were reported in 13 cases, but, unfortunately, no control group was available and pretreatment addiction severity measures were unclear.

Implications

Contingency management techniques appear promising, especially in structured situations such as inpatient settings and methadone programs. Methadone, as would be expected, is a potent reinforcer of behavior. This quality of methadone can be systematically utilized to reinforce beneficial behavior such as attendance at counseling sessions, abstention from street drugs, and ingestion of disulfiram (in alcoholic opiate addicts). More studies are needed on the application of contingency contracting to large treatment programs. It appears reasonable to assume that this method would clarify treatment procedures and improve outcome (Stockdale et al. 1977). In order to advance our knowledge in this area, it is important that studies include a control group, random assignment to contingency treatment, and clear outcome measures.

EXTINCTION OR DESENSITIZATION PROCEDURES

A systematic effort to extinguish conditioned responses which have developed throughout the course of addiction would appear to be a logical approach. This method directly follows from the assumption that conditioned responses are helping to maintain drug-taking behavior. Thus an attempt to extinguish these responses would appear logical. To accomplish this, exposure to the situations associated with drug taking should be accomplished, but drug effects must not follow. Kraft (1970) in a series of case reports of amphetamine-barbiturate users found certain social situations to provoke drug taking. His treatment consisted of setting up hierarchies of such situations for each patient (Wolpe 1958) and exposing the patient to each one beginning with the least evocative situation. Hypnosis and relaxation were used to prevent the patient from responding in the usual way with anxiety and drug ingestion. Although definition of population and followup were minimal (Kraft 1976), the results were encouraging.

Our group (O'Brien 1975) has been able to obtain (by behavioral interview) hierarchies of stimuli which provoke craving or withdrawal responses among addicts. When slides or video tapes of these situations were shown to addict patients, the response was variable. Some reported strong drug craving and others reported no effects (O'Brien et al. 1974). In subsequent studies we have thus far failed to find stimuli which are consistently effective. Negative affectual responses to drug-related slides have been reported by Teasdale (1973) and physiological changes in response to video tapes have been reported by Sideroff and Jarvik (1977). If a simple technique could be found for producing conditioned craving in the clinic, patients could be systematically desensitized. Of course, it is not certain how much generalization there would be to the natural environment. For optimum effectiveness it might be necessary for patients to be desensitized in situations that clearly resemble their own neighborhoods.

Narcotic antagonists have also been considered as an aid to extinction of drug-conditioned responses (Wikler 1974). Antagonists are discussed elsewhere in this volume. While a patient is receiving an antagonist such as naltrexone, he is effectively "protected" from most of the effects of injected opiates. Thus he can be exposed to stimuli which provoke opiate use and even use opiates with little or no reinforcement. However, most patients who are maintained on narcotic antagonists rarely test them by injecting heroin. This is confirmed by urine tests as well as by patient reports (Kleben et al. 1973; O'Brien et al. 1974). The patients report that once they are convinced that opiate effects will be blocked by the antagonist, they do not wish to waste their money by using heroin. Since the addicts do not perform the rituals which usually precede drug taking, they do not actually extinguish the conditioned responses associated with this behavior.

Meyer et al. (1976) have reported that hospitalized former addicts on naltrexone will usually not continue to inject heroin voluntarily even when the drug is readily available at minimal cost. Active extinction, therefore, does not seem to occur naturally. Our group (O'Brien et al. 1974, O'Brien 1975) has given former addicts maintained on antagonists (cyclazocine, naltrexone) opiates to self-inject on a regularly prescribed basis as part of an experimental treatment program. The behavior of these addicts changed remarkably over 5 to 25 self-injections and this occurred whether the injections contained saline or opiate (double blind). The procedure (including pre- and postinjection rituals) was reported as mildly pleasant after the first several injections. Subsequently, however, the patients reported the effects as dysphoric and upsetting. Some became angry and many refused to continue the injections despite cash inducements. Although the blocked self-injections resulted in the patients' no longer enjoying the drug-taking rituals, long-term outcome did not appear to have been affected. Followup at 1 month and 6 months after stopping naltrexone in 35 patients showed nonsignificant differences between outcome for naltrexone patients who participated in active extinction procedures and those who did not (O'Brien and Greenstein 1976).

Implications

While evidence has been accumulating which indicates that conditioned responses (CRs) develop in addicts during the course of addiction, the clinical importance of these CRs is still uncertain. Attempts to directly extinguish the CRs associated with drug-injection rituals have led to changes in self-injection behavior, but no significant impact on overall outcome has yet been demonstrated. More effective extinction procedures may be necessary. Perhaps trials could be conducted in the natural environment where more drug-related stimuli could be extinguished. Cognitive effects (Meyer et al. 1976) must be considered also. Former addicts maintained on naltrexone know that opiate effects would be antagonized and this may put them in a "no drug available" cognitive state. This state might inhibit CRs to drug-related stimuli. When naltrexone is stopped and the cognitive state is "drug available," the CRs may occur, causing some patients to relapse. This hypothesis has not yet been tested.

There is also a suggestion from one animal study that conditioned drug effects involved the endogenous opioid-peptide system. Lal et al. (1976) found that hyperthermia could be produced as a conditioned response (CR) in rats by pairing a conditioning stimulus (CS) with a morphine injection. Subsequently hyperthermia could be produced by the CS alone but the CR could be blocked by naloxone, an opiate antagonist. In humans, some conditioned responses have been shown to occur in the presence of naltrexone (O'Brien 1975) but core temperature responses have not been examined as in the Lal et al. study. Future studies, therefore, should include an examination of possible conditioned effects on endogenous opiates in humans.

HYPNOSIS

There is surprisingly little that is available in the literature on the use of hypnosis as a treatment method in drug addiction. Most of the studies that are available are anecdotal reports conducted without adequate controls. In general, hypnosis appears to be most valuable when used as an adjunct in a comprehensive treatment approach. Its use has been applied in a number of specific ways. It has been used to link some aspects of drug-taking behavior and drug self-administration with some of its negative consequences such as nausea, anxiety, and other negative reinforcers of such behavior (Bryan 1967). This is an aversive conditioning approach which parallels in many ways the use of covert sensitization (Cautela and Rosensteil 1975; Wisocki 1973). It has also been used to produce a reward response using the imagery of a previous "good trip" or a happy drug experience without the injection of drugs (Bauman 1970). This, in a way, is a substitute gratification approach. The advantages of such an approach are that self-induced hallucinated experiences are not against the law, they are free and totally under the subject's control, and thus provide the need for independence, without depriving the person of the kick, adventure, or escape previously supplied by injection or ingestion of illegal, expensive drugs with unpredictable present or future effects. Because the revivification of a good trip is legal and under the control of a professionally trained person, it is argued that the difficulties of the addict associating with criminal elements in order to procure drugs may be largely eliminated. Hypnosis has also been used as an ancillary method of teaching deep muscle relaxation and for systematic desensitization. In this respect, hypnosis very closely parallels the use of other techniques described in this chapter which are capable of eliciting the relaxation response. The use of revivification through sensory-imagery conditioning to relive the drug experience has also been applied during drug withdrawal to attenuate the disagreeable subjective sensations produced by withdrawal. (Kroger 1963; Hartman 1972; Ng 1978).

Techniques for handling drug addicts by group hypnotherapy have been described by Ludwig et al. (1964). Their study was conducted at the U.S. Public Health Service Hospital in Lexington, Kentucky, with 22 male addicts. It was the belief of the investigators that the hypnotherapeutic techniques which were most successful in eliciting positive responses were those which seemed more magical, more authoritative, and oriented toward dealing with current, practical reality problems. They found that for those drug addict patients with a diagnosis of sociopathy, passive-aggressive personality disorder, or inadequate personality, "insight oriented" treatment seemed to hold little meaning. Rather, the patients were more concerned with answers to such practical questions as how to increase their willpower, how to stay on a job and assume responsibilities, how to increase their motivation to stay off drugs, how to relax, and how to overcome boredom.

The hypnotic group setting also appeared conducive to extending the duration of the therapeutic session beyond its ordinary limits through posthypnotic suggestions, such as giving various writing assignments or issuing instructions for practicing certain autohypnotic techniques. The authors stated that group hypnosis has some severe limitations. It did not prove useful as a method for dealing with deep, insightful material, nor did it seem to encourage much meaningful introspection. Despite the apparently superficial techniques employed, it was of interest that no patients, even those who claimed no benefits from treatment, criticized the superficial, practical orientation or expressed a need for a more probing, uncovering type of therapy. The authors concluded that, "It may well be that group hypnotherapy may be a choice treatment for patients who are very dependent, alloplastic in their attitudes, possess little psychological-mindedness or tendency for productive introspection, and have an authoritative orientation toward interpersonal relationships."

Implications

Despite some promising clinical reports, the usefulness of hypnosis has not been tested in a controlled study. The data available suggest that nonspecific or placebo effects are probably important factors in this procedure as in the other innovative treatments described. It is unclear at this time whether hypnosis offers advantages over other relaxation and imagery procedures described earlier.

ACUPUNCTURE

Acupuncture has been practiced in China for more than 5,000 years. It has been used in the treatment of various illnesses but principally for the relief of pain of different etiologies. The wide publicity given the successful use of acupuncture as a method of anesthesia in surgery in the People's Republic of China, following President Nixon's trip to that country in 1972, generated considerable interest in the layman as well as in the medical profession in this particular modality.

The use of acupuncture in the treatment of addiction represents a recent application of a very old treatment technique. Its use in the treatment of addiction derives from a rather serendipitous observation made by Dr. H. L. Wen of Hong Kong in 1972. Dr. Wen and his colleague, Dr. Cheung of Kwong Wah Hospital, accidentally discovered that during anesthesia induced by acupuncture for neurosurgery, those patients who were addicted to opium and were having withdrawal symptoms reported relief of their symptoms during the acupuncture induction. Wen and Cheung subsequently reported on a series of 40 heroin and opium addicts that acupuncture, combined with electrical stimulation, was effective in relieving the symptoms of narcotic withdrawal (1973). Wen's technique consisted of application of gauge 30 acupuncture needles subcutaneously into the concha of both ears (the so-called "lung" points of the ears) and connecting the needles to an electrical stimulator which provided stimulation for periods of approximately 30 minutes. The stimulus current was titrated to the level of comfort and tolerance of individual patients, using a frequency of 125 Hz and a voltage of 12 volts. The authors reported that symptoms of "lacrimation, runny nose, aching bones, wheezing, cramps in the stomach, cold feeling, and irritability," usually disappeared after 10 to 15 minutes of stimulation. They further reported that while under stimulation, the patients' craving for the narcotic drug ceased and that they began to feel more relaxed and less lethargic.

Since this initial report of Wen and Cheung, a number of investigators both in this country and abroad, employing variations of this basic acupuncture paradigm, have reported beneficial effects on the narcotic withdrawal syndrome and on the clinical opiate detoxification process. The various "acupuncture" procedures that have been reported to be effective in reducing the discomfort of withdrawal are quite diverse.

In their initial studies, Wen et al. apparently stimulated a larger number of "acupuncture points," but subsequently reported that stimulation of only one point on each ear (the so-called "lung" point situated in the concha of the ear) was adequate. Other variations of this basic paradigm employ varying numbers of "acupuncture" points and various stimulation techniques. These include the use of needles with manual or electrical stimulation (Kao et al. 1974; Sainsbury 1974); use of staple puncture with electrical stimulation (Sacks 1975; Tennant 1976); as well as the stimulation of "acupuncture" points with surface electrodes without needles (Patterson 1976).

While the array of favorable reports that have been published are quite impressive, the claims of the effectiveness of acupuncture appear to be based largely upon anecdotal data collected without adequate controls and without proper standardization of procedures, making comparisons of techniques and results difficult. From the studies reported to date, it is not possible to conclude whether the salutary effects of the acupuncture treatments derive from expectational factors alone (i.e., the milieu of "halo" effects), from the administration of the treatment ritual, or from certain specific components of the treatment ritual that make up the acupuncture treatment paradigm. For example, since so many seemingly different techniques appear to be effective, what are the basic elements which may be responsible for therapeutic efficacy? How crucial is the role of expectation which the therapist and the patient bring to the treatment process? Is the ritual (i.e., the administering of a reputedly potent treatment) a critical part of the paradigm?

Can one isolate different components in the ritual itself which are responsible for particular biological effects? Is the needle insertion a critical component or is the stimulation itself the important component? Is the combination of needle with electrical stimulation more effective than the use of either stimulation or needle alone? How critical and specific are the so-called "acupuncture" points? Is specific localization of these points vital or is it the sensory modulation produced by stimulation of particular sensory distributions the critical variable? Obviously these questions will require much intensive research conducted through properly controlled studies before they can be adequately answered.

Implications

In a treatment modality as complex as that inherent in the acupuncture paradigm, the difficulty encountered in trying to isolate causal factors in such a complex set of relationships should not detract from the possible therapeutic uses of such a modality. There is clearly a great need for better controlled studies to develop our theories of the mechanisms of action of acupuncture. At the present time, the possible mechanisms by which electrical acupuncture produces alleviation of the narcotic withdrawal syndrome are highly conjectural. In animal studies utilizing an experimental model for auricular electroacupuncture Ng et al. (1975) found that electrical stimulation of the conchae of morphine-implanted rats produced significant attenuation of the naloxone-precipitated withdrawal syndrome, such as teeth chattering, "wet dog" shakes, and hyperactivity. The investigators observed that the depression of motor activity produced by electroacupuncture did not appear to be specific only to the withdrawal period, since it also reduced the baseline spontaneous activity of rats prior to naloxone injection. These findings suggest that electroacupuncture stimulation may cause the release of a substance with morphine-like properties and are consistent with observations in humans (Mayer et al. 1976) and in animals (Pomeranz and Chin 1976) which show quite convincingly that naloxone injection can abolish the analgesia produced by acupuncture stimulation (manual as well as electrical). Hypophysectomy has also been found to abolish most of the acupuncture-induced analgesic effects (Pomeranz et al. 1977). The somewhat slow induction period and the long lasting effects of acupuncture further implicate a neurohumoral mechanism. These observations have led to the hypothesis that needling in appropriate points can stimulate sensory nerves to activate the pituitary or brain stem to release endorphin which may at least in part mediate some of the acupuncture-induced effects (Pomeranz 1977). However, it should be pointed out that while there is preliminary evidence to suggest that manual or electrical needling upon the organism may activate certain central neurohumoral mechanisms including the endorphin system, it is still far from clear which of the components embodied in the acupuncture paradigm (needles, stimulation, sites of stimulation, nature of stimulation, etc.) are the critical factors in initiating such responses. Thus it is premature to attribute any causal relationship between the particular treatment technique utilized and the observed reported improvement in subjective symptoms in addicts undergoing withdrawal.

CONCLUSIONS

The number of different innovative treatments described here reflects the considerable interest among clinical investigators in developing more effective treatments for addiction. While the originators of the new treatments are usually enthusiastic and report good results, controlled studies with objective outcome measures are necessary to determine efficacy. Even results from controlled studies may be only applicable to the population examined.

The treatment methods briefly reviewed in this chapter should be viewed as experimental. Some, such as contingency contracting, relaxation training, and covert sensitization, can easily be applied in many clinical situations. One is hesitant to recommend their wide application, however, because apart from case studies, there is little evidence as to their efficacy. Any clinician wanting to try one of these therapies should be aware of their experimental nature and consider setting up a controlled outcome study if facilities permit.

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18. Criminal Justice Clients

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INTRODUCTION

The term "criminal justice client" generally refers to an individual entering a drug treatment program under coercion from the criminal justice (CJ) system. However, a broader definition would include (1) a large number of drug users who are incarcerated, some of whom are also involved in institutional treatment programs, and (2) an even larger number who are on probation or parole but not enrolled in any outside form of treatment. Services provided under probation and parole vary widely, but often include counseling, job referrals, legal aid, and other help-oriented endeavors as well as the traditional monitoring function.

While coercion is the central element of the CJ intervention, it may be incidental to the individual's treatment status. Some probationers and parolees enter methadone maintenance programs against the advice of their supervising officer, and many go into treatment for reasons independent of their legal status. On the other hand, several authors have argued that the voluntary entry into treatment is often more illusory than real (Helms and Russell 1973; Looney and Metcalf 1974). In particular, heroin addicts live in a highly coercive environment and their decision to "volunteer" for treatment is often in response to family pressures, the inability to support a habit, poor health, and other reasons not necessarily related to the desire to permanently overcome addiction.

In addition to the fact that CJ and non-CJ clients are not clearly defined on the dimension of coercion, there is also some blurring of the distinction between treatment and punishment or social control. Methadone maintenance contains elements of social control as well as individual treatment. Similarly, whether the CJ client diverted into a therapeutic community (TC) is being treated or controlled depends on the perspective of the observer. Both the court and the client are likely to weigh the deprivation of freedom in the TC against that resulting from the normal CJ disposition. In short, while many treatment personnel have a strong ideological commitment to the clear separation of treatment versus coercion or control, such distinctions are often difficult in practice.

CRIMINAL JUSTICE CLIENT POPULATION

The number of drug users in, or processed by, the CJ system may be estimated from studies identifying users in arrestee and other CJ samples. Similarly, the percentage of the drug-using population that is under CJ supervision at a given time can be estimated from career histories of known drug users, although these estimates may be biased by the lack of representativeness of the drug-user samples.

Eckerman et al. (1971) sampled arrestees (excluding minor offenses) in six major cities in 1971 and found the percentage of current heroin users as defined by urine analysis and interview ranged from 16 to 23 for five cities, and 53 for New York. Current amphetamine use ranged from 3 to 20 percent, and barbiturate use from 8 to 31 percent. McBride (1976) found 16 percent of a 1975 sample of Miami arrestees were current heroin users; 3 percent were currently using amphetamines and 10 percent tranquilizers or sedatives. Kozel and DuPont (1977) found 24 percent of some 37,000 urines collected at the Washington, D.C., Superior Court lockup during 1972-75 were positive for one or more drugs, and

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16 percent were positive for morphine/quinine. A New York study of nondrug felonies between 1971 and 1975 showed from 24 to 30 percent of such offenders required heroin detoxification (Association of the Bar of the City of New York 1977). In a 1974 national survey of prison inmates, Barton (1976) found 21 percent reported having used heroin daily, and 14 percent were using daily at the time of arrest. The percentage having used amphetamines and barbiturates daily were 11 and 8, respectively.

Studies estimating the percentage of time drug users spend under CJ supervision are mostly limited to samples of narcotic users. One career study of heroin users committed to the California Civil Addict Program in 1970 found that 24 percent of the time from first narcotic use to admission (average age 25) was spent in jail or prison, and another 28 percent on parole or probation (McGlothlin et al. 1977b). Incarceration time following treatment termination from the Federal Drug Abuse Reporting Program (DARP) averaged 13 percent (Simpson and Savage 1976).

Turning to data on drug treatment patients, the national CODAP reports show only about 15 percent are also on legal supervision (NIDA 1976). However, this figure seems likely to be an underestimate of the actual number under some form of CJ legal status at the time of admission to treatment. Data on the earlier DARP sample showed 24 percent of treatment entries were on probation or parole and another 13 percent were awaiting trial at admission (Simpson et al. 1976). Of those entering therapeutic communities, 58 percent had some form of CJ legal status. Other recent treatment studies utilizing large samples have reported an even higher rate of legal involvement. Harford et al. (1976) report 64 percent were under legal pressure at admission and 45 percent were on probation or parole; DeAngelis et al. (1975-76) found 56 percent of methadone and 67 percent of drug-free clients reported legal involvement at admission.

EFFECTIVENESS OF CRIMINAL JUSTICE APPROACHES

There are three general sources of information on the compulsory treatment of drug users; (1) CJ programs—institutionalization, halfway houses, parole and probation; (2) non-CJ treatment programs which admit clients both with and without CJ legal status; and (3) TASC (Treatment Alternatives to Street Crime) and other diversion programs.

CJ Programs

A recent survey of State prisons (Research Concepts, Inc. 1973) found very few contained comprehensive drug treatment. Reviews of compulsory treatment have generally concluded that institutionalization is minimally effective in preventing the resumption of drug use following release, whether or not special programs are employed (Petersen 1974). Evaluations of the halfway house approach have been equally discouraging (Geis 1975).

Studies on the effect of probation and parole have been somewhat more positive. A followup study of parolees exposed to varying amounts of counseling and other agent contact found lower violation rates for the experimental group; but the group differences were not maintained subsequent to discharge (Bailey 1975). A recent evaluation of the California Civil Addict Program showed that close supervision and antinarcotics testing resulted in substantially less daily narcotic use than that exhibited by a comparison group who obtained a discharge by writ shortly after admission (McGlothlin et al. 1977a, McGlothlin 1977b). There was also some indication of a reduction in addiction following the 7-year commitment, but the differences between the two samples were relatively small. At the time of the interview, some 12 years after admission, about 45 percent of those not incarcerated in both groups were currently using heroin, and an estimated 15 percent were addicted. Further analysis showed that daily narcotic use under intensive supervision with urine testing was about one-half that when on regular probation caseloads without testing, which, in turn, was little more effective than no supervision. Similarly, the average length of uninterrupted daily narcotic use following resumption of addiction was about 6 months compared to 10 to 13 months under regular probation or no supervision. In general, close supervision reduced the amount of daily narcotic use but did not increase absolute abstinence. The success of close supervision in reducing daily use is probably a result of the unique opportunity to monitor the proscribed behavior—a condition which does not exist for most other illicit activities.

The CJ Client in Outside Treatment Programs

Three programs have begun with a uniform sample of addict parolees and superimposed additional outside treatment (Brill and Lieberman 1969; Mandel and Amzel n.d.; McCabe et al. 1975). The Washington Heights project (Brill and Lieberman 1969) compared a sample of parolees receiving intensive caseworker intervention with a comparison group receiving traditional parole supervision from a Special

Narcotics Unit, but in small caseloads. While 91 percent of the experimental group were maintained in outpatient status for 18 months, they did not significantly differ from the comparison group on measures of heroin use, criminality, work, and social adjustment. However, both groups performed substantially better than those receiving normal parole supervision.

The NARA I and III (civil commitment) and NARA II (prison parolees) programs have been evaulated with inconclusive results (CONSAD Research Corp. 1974; Mandel and Amzel n.d.). The first study encountered difficulties in locating subjects, obtaining urine specimens and collecting arrest data. While the self-report data showed relatively low heroin usage during the 4 weeks prior to interview for those participating in both the inpatient and aftercare portions of the program, the results for those ruled not suitable for admission, and not suitable for aftercare treatment, showed only slightly poorer performance.

The final study employed the closest monitoring reported in the literature—daily urine analysis with confrontation within 24 hours of a positive test (McCabe et al. 1975). Participants were also given weekly group therapy. Of 371 parolees given an early release to this program, only 29 percent remained after 6 months. Eighteen percent completed the 2-year program, and 6 percent were abstinent throughout. Twenty-six percent absconded, 45 percent were returned to prison for narcotics use (more than five positive tests or unauthorized absences within a 10-day period), and 10 percent were discharged because of arrest or other reasons. The addition of contingent administration of naloxone to the above regimen yielded similar results (Hanlon et al. 1977).

In summary, the results for the above programs employing outpatient drug-free, or primarily drug-free, treatment suggest that outcomes were not appreciably better than that which would have resulted from close parole supervision alone.

The remaining studies cited here began with treatment populations and examined retention and outcome as a function of legal status. This approach has two major disadvantages in terms of assessing the impact of compulsion. First, probation or parole status is not necessarily synonymous with coercion to enter and remain in treatment. Second, since there is no assurance of comparability between the CJ and non-CJ groups prior to treatment entry, differences in outcome cannot necessarily be attributed to the client's legal status.

Three methadone maintenance studies have examined outcomes for CJ and non-CJ samples. Joseph and Dole (1970) reported that the success rate for 269 patients on probation or parole was 72 percent compared to 82 percent for the total population of some 1,800. Perpich et al. (1973) found CJ clients had a higher arrest rate both before and during treatment. Retention in treatment was approximately the same, but the CJ sample had a higher percentage of positive urines. Wieland and Novack (1973) also found CJ clients had a greater number and more recent arrests prior to treatment, as well as more arrests during treatment. They also demonstrated a higher rate of positive urines; retention in treatment and employment were slightly lower than for the volunteer sample.

Two studies of therapeutic communities have reported CJ clients remain in treatment longer than do volunteers (Aron and Daily 1976; Dopkins and Washburn 1977). In another inpatient facility, an admission policy of requiring clients to exhibit self-motivation for treatment was dropped without affecting outcome (Looney and Metcalf 1974). The authors conclude that external motivation from the family or court is often a necessary requisite for successful treatment. Similarly, Rinella (1976) reports that the outcomes for CJ clients in a hospital therapeutic community are equivalent to those for volunteers, although their presence may adversely affect the therapeutic functioning of the staff.

Harford et al. (1976) have conducted one of the more extensive analyses on the relation between legal pressure and treatment outcome. Their sample consisted of 404 treatment entries distributed among residential, drug-free outpatient, and methadone maintenance programs. Sixty-four percent were on probation, parole, or awaiting trial at the time of treatment entry. There were no overall significant differences between CJ and non-CJ clients with respect to program completion or length of retention; however, older clients on probation were retained for shorter periods than those not on probation.

While the above studies have generally been concerned with the effect of CJ coercion on treatment outcome, it is of interest to pose the reciprocal question—does the availability of treatment affect the amount of coercion necessary to achieve a given level of control? Evidence on this issue is provided by a study of the California Civil Addict Program in relation to a 1970 policy change significantly relaxing the conditions for remaining on outpatient status (McGlothlin et al. 1977b). Self-report data indicated that an initial result of the policy change was to substantially increase the rate of daily narcotic use while on outpatient status (25 percent under lenient versus 16 percent under strict conditions). However, after some 20 to 25 percent of the nonincarcerated sample were enrolled in methadone programs, daily heroin use was again equal or lower than that for the earlier more coercive regimen. It appears that the availability of methadone maintenance was the major factor enabling comparable behavioral results to be obtained with less coercion.

TASC and Other Diversion Programs

As the name implies, Treatment Alternatives to Street Crime was designed to channel heroin addicts being processed by the CJ system into treatment programs in the hope of reducing criminal behavior associated with addiction. Since its initiation, the program has been broadened to include other drug users, and heroin addicts now make up 62 percent of participants.[1] The three basic TASC functions are (1) screening of arrestees to identify drug users, (2) diagnosis and referral into treatment programs, and (3) monitoring TASC clients and reporting those leaving treatment or otherwise violating regulations to the CJ system. While the majority of TASC clients enter treatment after arrest and before trial, only a small percentage are true diversions in the sense that entry into treatment is substituted for normal CJ processing. Satisfactory performance in treatment may, of course, influence the outcome at the time of trial. Other means of entering TASC are via posttrial sentencing conditions, or direct referrals from probation and parole officers.

About 30,000 persons have been referred to treatment through TASC since its initiation in 1972, and some 4,200 are now in the program. The maximum treatment period is 24 months with most falling in the 6 to 18 month range. Only 11 percent of current TASC clients are referred to methadone maintenance, although this modality has accounted for up to 26 percent in earlier periods. The TASC program is designed to be quite flexible to accommodate local CJ procedures, and the emphasis varies quite widely among different cities. However, the three main functions of screening, referrals, and monitoring are maintained throughout.

Evaluation of the TASC programs has been primarily limited to study of program procedures (Law Enforcement Assistance Administration 1976). It has been successful as a treatment outreach function, with about 50 percent of referrals entering treatment for the first time. About 10 percent are rearrested on a new charge while in TASC programs, and 30 percent are classified as dropouts and/or failures.

Although an assessment of the extent to which TASC has accomplished its overall goals is not yet available, it is clear that the approach has generally been well received by the courts. The judge is provided with an assessment of drug involvement shortly after arrest and an alternative to a straight CJ disposition. Perhaps more importantly, the formal monitoring function provides prompt and reliable feedback on any violations of the conditions accompanying treatment referral.

A number of States and cities have also instituted diversion programs, though generally on a more informal basis than TASC. California initiated a true diversion program in 1972 aimed at first-time drug law offenders. In 1975, some 24,000 were diverted, 76 percent of whom were charged with marihuana offenses (California Bureau of Criminal Statistics 1975). Only 3 percent were for narcotic offenses. The minimum treatment or education period is 6 months with a mean stay of about 8 months. Following successful termination, the original charge is dismissed—87 percent were considered successful by this criteria. The law has recently been broadened to include a larger percentage of narcotic offenders.

Summary

The results cited in this chapter are primarily limited to the outcomes of approaches employing coercion. There is fairly strong evidence that close probation or parole supervision accompanied by urine testing is effective in reducing daily narcotic use. It is not clear that such supervision increases absolute abstinence, or that it results in significantly less drug use following the termination of probation or parole. The combination of parole status and rather extensive outpatient drug-free treatment has not been shown to appreciably improve on the results obtained through close supervision alone.

Several studies have compared retention and treatment outcome for CJ and non-CJ clients. The CJ group generally evidences higher arrest rates both before and after treatment entry, as well as more drug usage during treatment. The data on time retained in treatment is mixed, although there is some evidence that CJ clients continue longer in therapeutic communities. While these results are of interest, they generally cannot answer the question of effectiveness of coercion in the treatment context because of the lack of pretreatment comparability of the two groups and the failure to define the extent and duration of the coercion involved. There is some evidence supporting the reciprocal relationship, i.e., that the availability of treatment, and particularly methadone maintenance, reduces the amount of coercion necessary to achieve a given level of drug use control among parolees.

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[1] P. Regner, Narcotics and Drug Abuse Program Coordinator, LEAA 1977, personal communication.

Evidence on the overall impact of TASC and other diversion programs is generally not yet available. They have been effective in a treatment outreach capacity and have generally achieved approval by the courts. By providing an alternative to CJ dispositions, as well as systematic monitoring of in-treatment behavior, they have at least temporarily helped resolve the judicial dilemma of how to deal with the heroin addict who is chronically involved in minor property crimes. Diversion programs have also been used to soften the CJ disposition for violation of marihuana and other drug laws that are in a state of transition.

IMPLICATIONS FOR FUTURE ACTIVITIES

Research

There is a need for controlled research on the effects of compulsory treatment in community programs. As discussed earlier, most recent studies have simply compared outcomes for CJ and non-CJ clients in existing treatment populations without defining the nature of the coercion or assuring the pretreatment comparability of the two groups. The impact of compulsion can best be examined by beginning with a population subject to uniform CJ coercion, and randomly assigning individuals to treatment or other dispositions. Another approach is to begin with a CJ population undergoing treatment and terminate the CJ status for a random sample. The feasibility of random assignments affords a distinct advantage over other treatment evaluations where such an approach is difficult or impossible.

It is important to clearly define both aspects of the independent variable—the nature and duration of the compulsion as well as the type of treatment provided. Often, investigators primarily interested in the treatment component have assumed that clients awaiting trial, on probation or parole status, or under court orders to enter treatments are, by definition, under compulsion to participate in treatment. In actuality, the extent of compulsion is often fairly negligible. A substantial number of informal court diversions do not actually enter treatment (American Bar Association 1972) and, even in the TASC system, judges may take action on as few as 6 percent of the reported violations (Law Enforcement Assistance Administration 1976). Similarly, treatment participation may be incidental to probation or parole status, and police typically rely on subsequent independent arrests to apprehend those who abscond. In short, it is important to assess the level of compulsion in practice as well as in theory.

Treatment

The phasing out of NARA and the New York Civil Addict Program is indicative of the decline in large-scale compulsory drug treatment administered by public health personnel. The continuing California program is operated by the Department of Corrections and is essentially a sentencing alternative for heroin addicts convicted of felony offenses (McGlothlin 1976). There also seems to be a growing trend toward lessening CJ sanctions for drug use and possession, and there have been close court decisions on the issue of broadening the Robinson decision to include decriminalizing heroin possession for personal use (Bogomolny 1976). Thus, it appears fair to conclude that there currently is a movement away from the concept of compulsory treatment justified as being in the client's best interest, such as the "rational authority" approach proposed by Brill and Lieberman (1969).

On the other hand, the courts continue to be faced with the problem of the addict who is chronically involved in income-generating crime—a problem that would persist even with decriminalization of the personal use of heroin as well as other drugs. In recent years, the courts have increasingly coerced such individuals into community drug treatment programs in lieu of incarceration, but with the primary justification being crime reduction. Such coercion is generally only effective when the alternative CJ disposition is considered more severe. Probation and parole officers also make extensive referrals of drug cases to community facilities.

Newman (1974) has argued for a clear separation of treatment and CJ roles. The former would be reserved for the volunteer, who is presumably self-motivated for behavioral change, while probation and parole would be utilized for the convicted criminal drug offender. Aside from the questionable assumption that treatment volunteers are self-motivated as opposed to being coerced by the overall social policy, this sharp distinction seems artificial for other reasons. For instance, would the community-administered methadone maintenance program be designated as treatment, but one operated by the probation department by some other label? For that matter, are the overall help-oriented activities of probation and parole excluded from the definition of treatment? Rather, it seems that as long as treatment programs and the CJ system are dealing with highly overlapping populations, ideological commitments will need to be modified to conform with reality. The situation would be clarified by the decriminalization of use and possession offenses for all drugs. The relevance of a history of addiction to the CJ disposition would then be solely in terms of its contribution to continuing nondrug criminal behavior. The coercive authority of the courts would not be related to drug-using behavior, but the courts would obviously maintain flexibility in terms of dispositions, including the option to divert into non-CJ treatment programs where this is considered appropriate.

Admittedly, the objective of protecting the remainder of society from drug-related crime will sometimes conflict with the client-oriented helping role of treatment. Weissman's (Weissman and Nash in press) argument for an active crime-containment role by treatment is one example. On the other hand, the criticism that methadone maintenance is a crime-control measure under the guise of treatment seems to be essentially invalid since the two goals are both appropriate and compatible.

A final point concerns the need to broaden the concepts of both drug treatment and crime control to include temporary improvement as well as permanent cures. As described in the chapter "Drugs and Crime,"[2] there is strong evidence that the amount of income-generating crime is closely associated with the frequency of narcotic use. The prevention of daily heroin use by either legal supervision or treatment largely eliminates the direct link between drug costs and property crime even though absolute abstinence is not achieved.

In summary, the cooperation of drug treatment and the CJ system is necessitated by income-generating crime resulting from a policy of containment through supply reduction. The crime-control objective is not always compatible with the traditional approaches to treatment; however, the overall benefit to the individual and society can probably best be realized by continued cooperative efforts along the lines of the TASC program.

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[2] See W. H. McGlothlin's "Drugs and Crime," this volume.

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drugs of recent public concern

A few drugs seem to deserve separate and specific consideration, because they have been subjects of recent concern. The use of PCP has increased in just the last year or two, as Parry establishes in his review of recent surveys in a later section. In this section Pittel notes the great concern in the media over the reputed effects of PCP, and reviews what is known and needs to be learned about the drug.

Inhalants and cocaine are not new on the drug scene, but not as much attention has been paid to inhalants as they deserve, and the use of cocaine has been increasing in recent years. The amphetamines and barbiturates are of interest as legally available drugs which are widely abused.

Pittel makes a point which is also made by the Task Panel on Psychoactive Drug Use/Misuse of the President's Commission on Mental Health. Each time a new "drug problem" arises, like the use of PCP, there is a general tendency to see it as unique, with accompanying public fear and even hysteria. The drug community must of course point out the dangers of such drugs, but should avoid implications of uniqueness that contribute to hysteria.

19. Inhalants

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INTRODUCTION

A large series of commerically available volatile solvents have the capability to intoxicate those who deliberately inhale them. They range from model airplane glue, fingernail polish remover, gasoline, paint thinner, liquid shoe polish, plastic cement, cleaning fluid, and wax strippers to a variety of aerosols. Literally hundreds of intoxicating volatile products are available in the home and in the marketplace. They are more available to young people than alcohol, and they can be found in very remote areas where alcoholic beverages cannot be obtained.

If the sheer number of solvents makes their scientific study difficult, the fact that the commerical products usually contain a shifting array of multiple solvents defies their definitive scrutiny. A lacquer thinner that caused a number of cases of serious, ascending peripheral neuritis was found to have 11 identifiable solvents plus impurities (Prockop et al. 1974; Prockop 1977). Nor can the extensive toxicological data from industrial exposure experiments be easily translated into information about the use of identical compounds for purposes of intoxication. The industrial experience derives from low concentrations of the vapor for long periods, whereas the abusing young person is exposed to extremely high concentrations intermittently.

EXTENT

Many studies have shown that solvents are the intoxicants of the very young, and more often of males than of females. However, shifts in this pattern are taking place with increasing numbers of persons over 21 years old and of females participating in inhalant sniffing. Underprivileged Mexican-Americans and American Indians are more often involved than blacks or whites (Goldstein 1976; Stybel et al. 1976). Middle-class youngsters are likely to experiment with these substances but are less likely to become chronic users. Within any community the distribution may be spotty with high-use neighborhoods scattered among districts where little use can be identified.

Often solvents are the first drugs of abuse, alcohol or tobacco being the only substances that may antedate them (Korman 1977). Solvent sniffing diminishes when adulthood is achieved and the legal purchase of alcoholic beverages becomes possible. Rural adolescents sometimes have a higher level of usage than their urban counterparts. Inhalants are the only class of drugs that may be more frequently used in grade or junior high school than in high school or college. It would be encouraging if this "maturing out" process were unaccompanied by an overinvolvement with other intoxicants. Unfortunately, this is not so; the consistent solvent user tends to move on to alcohol, sedatives, and other drug classes.

School surveys will underreport the extent of solvent abuse. Many survey instruments do not even inquire into solvent use, and since many users are truants or dropouts, they are not ordinarily captured. Recognizing these deficiencies, table 1 provides some information on the extent of inhalant abuse from a national survey and from selected special-population surveys.

CAUSATION

The intentional inhalation of volatile agents is often a peer-originated and peer-perpetuated activity. In poor communities much of the learned behavior occurs on the street. Mimicking the behavioral displays of the leader or of other peers not only insti-

TABLE 1.–*Selected recent surveys of solvent abuse extent*

Author	Year of study	Percent ever used	Percent current using (past month)
Abelson et al. (1976)			
National survey	1975-76	8.1	12 to 17: 0.9 18 to 25: 0.5 Adults: 0.5
Padilla et al. (1976)			
Mexican-American children in Los Angeles	1975	25.0	13.1 (past week)
Goldstein (1976)			
Junior and senior Pueblo tribe high school students in New Mexico	1975	17.2	13.9 (more females than males)
Hays (1974)			
Houston grade 7-12 students	1974	11.4	2.7 (past week)

gates a practice like sniffing,[1] but also dictates what kind and brand of solvent will be inhaled.

Unsuccessful and unrewarding school experiences have been mentioned as precipitating factors. Whether these are causes or effects of consistent solvent use is difficult to sort out. Personality deficiencies are reported to be important predisposing factors in confirmed inhalant abusers. Korman (1977) has recently reviewed the subject. Youngsters overwhelmed with anxiety, depression, or both; borderline or overt schizophrenics; and those with character disorders employ inhalants in efforts at self-treatment for their intrapsychic and interpersonal distress (Cohen 1973).

Social disorganization within the community also contributes to the practice. Growing up in an environment of hopelessness, one that provides little in constructive alternative activities, is an obvious etiologic factor in the flight to inhalants. Familial disorganization has been reported to be a contributing factor in certain instances (Korman 1977).

It is evident that none of the causative elements mentioned acts to the exclusion of the others. It is disorganized existence, whether internal or external, and usually both, that is conducive to heavy, sustained inhalant use.

CONSEQUENCES

Mental

The acute state resembles alcoholic intoxication except for its briefer duration. The period of relative stimulation and of disinhibited behavior is also similar to alcohol's. This can result in accidental injury or death and the releasing of aggressive impulses against one's self or others. It is because of such behaviors that the inhalant abuser becomes more visible in the criminal justice system than in the educational system. New evidence is accumulating that confirms older clinical impressions that a chronic brain deficit occurs with extensive solvent abuse (Berry, in press; Korman 1977). From 40 to 60 percent of chronic sniffers were rated as brain impaired on the Halstead-Reitan Neuropsychology Battery. Whether this impairment is reversible remains to be determined. Chronic solventism is a disorganizing experience for one's self and one's family. Psychological maturation is arrested, and aberrant behavior is not uncommon. The user may "turn on" his younger siblings. School failure is a normal consequence of solvent abuse. Shoplifting and other delinquent activities become a way of life.

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[1] Sniffing, inhaling through the nose, is used in this paper to include huffing or mouth inhalation.

2.7

Physical

Some of the volatile solvents are known poisons. Carbon tetrachloride is so toxic that it has been removed from commercial trade, and benzene's use is limited for the same reason. Hexane and leaded gasoline can cause a serious polyneuritis, and the latter is capable of producing an encephalopathy. Toluene is one of the safer and more widely used solvents, but it has been involved in instances of kidney, nervous system, and bone marrow disorders. Metallic spray paints and other aerosols may have dangers caused by secondary ingredients rather than by the solvents themselves.

Sudden sniffing death has been described by a number of authors (Bass 1970; Taylor and Harris 1972; Flowers et al. 1972). It consists of the inhalation of a solvent or aerosol propellant usually associated with strenuous activity or a reduced oxygen content of the blood. Ventricular fibrillation or some other arrhythmia occurs, and the person dies abruptly. Another mode of death is suffocation due to the inhalation of the solvent in a closed space—a plastic garment bag, for example.

TRENDS

In the absence of periodic surveys of the high-risk and general populations that will identify the degree of chronic usage, it is not possible to say whether we are on the upward or downward slope of the prevalence curve. Impressions from those in the field is that the abuse of inhalants is certainly not decreasing and may be increasing.

As with many other drugs of abuse, the male-female ratio is decreasing and the age range of solvent use is spreading. The joint use with other agents is also observed, marihuana, alcohol, and sedatives being the most frequent substances that are combined with inhalants.

Within the group of volatile substances certain usage trends are evident. Model airplane glue is no longer a commonly used intoxicant having been supplanted by spray paints, gasoline, PAM (a vegetable oil spray), transmission fluid, liquid shoe polish, paint thinners, and related solvents. From a public health standpoint, the shift has not been entirely favorable since the main solvents in airplane glue are toluene and acetone, less harmful chemicals than hexane, 2-hexanone (methyl butyl ketone), and others.

During the past few years a surge of gold and bronze spray paint inhalation has swept through the Southwest and other parts of the country (Wilde 1975). Aside from the other hazards of aerosol sniffing, the possible absorption of the metallic copper, a hepatotoxin and neurotoxin, is cause for concern (Merck Manual 1977, p. 1174).

More recently, the volatile nitrites, amyl nitrite and isobutyl nitrite, have become quite popular among adults. For years, amyl nitrite ampules (Aspirol or Vaporole) were occasionally inhaled prior to orgasm to achieve a subjective sensation of time prolongation. This apparently occurred because of the intense cerebral vasodilation that rapidly followed inhalation. At present these "poppers" or "snappers" are being used, not only as orgasm expanders, but also as brief, altered-state-of-consciousness-producers. Bottles of these liquids are sold in pornography shops under the trade names of Locker Room, Jac Aroma, Rush, Kick, Bullet, and Toilet Water. In some instances they are sniffed at short intervals throughout the waking hours. Little is known about their adverse effects under conditions of chronic use.

FUTURE EFFORTS IN PROGRAMING

Research

Better data are needed on the extent of the problem, especially the numbers of heavy, protracted users. The difficulties of obtaining these data have been mentioned. Improved medical examiner's statistics are necessary. In many instances of sudden death, solvent poisoning is not looked for. Unless alveolar air is examined, some cases of inhalant-caused death will not be found. The level of consciousness about inhalants should also be raised among clinic and hospital personnel. In instances of polydrug use, the contribution of solvents may be neglected. Juvenile halls are excellent sources of solvent abuse populations, and none has been thoroughly studied.

Clinical investigations are essential, especially in the area of neuropsychological evaluation. We must learn which solvents can cause organic brain dysfunction and whether the process is reversible. Cognitive impairment may be one reason why the treatment outcome of solvent-abusing clients is so poor, in that they are unable to cooperate because of confusional states or thinking deficits.

Animal studies mimicking the solvent abuse situation have been started, but much more work is needed. Long-term effects, including the carcinogenic potential, could be estimated from animal models. The numerous solvents and the common use of mixtures make such a test program complicated and costly. Therefore, a simple, reliable model should be sought

We know little about tolerance, cross-tolerance, withdrawal, and other basic pharmacologic matters for individual volatiles. Neither do we know about solvent-drug interactions such as potentiation or antagonism. These chemicals dissolve lipids and fats, but whether their long-term use affects lipids in the brain cells remains unknown.

The animal studies should be done on young animals, as the brain of a youthful organism might be more vulnerable to toxins than the adult brain. Learning ability, complex reaction time, maze running, and other psychomotor skills should be studied under the influence of volatiles and during sober periods.

PREVENTION

A reduction in available supplies will decrease the numbers of new users and tend to assist established users to discontinue the practice. Although inhalants permeate every aspect of present day existence, certain developments outside the drug abuse field may decrease the accessibility of some inhalant products. Environmental concerns about aerosols interfering with the ozone layer in the troposphere have resulted in a reduction in the use of the Freons as propellants. It is important that manufacturers not substitute other intoxicating materials for fluorocarbons when making the change to other propellants.

Now that gasoline has become more expensive, locks are seen on gas tanks more frequently. They will act as a deterrant for some, but not all, abusers. Another welcome development will be the eventual elimination of tetraethyl lead from gasoline. This will decrease the morbidity due to lead poisoning from chronic gasoline inhalation.

It will be necessary to obtain the attention and cooperation of the manufacturers of commercial solvents to achieve further supply reduction. Nine years ago the Testor Corporation added a small amount of artificial oil of mustard (allyl isothiocyanate) to model airplane cement to make its inhalation, but not its use as an adhesive, noxious. This is an example of an effort by industry to cooperate in dealing with an abuse problem. Although the use of unpleasant additives will not have widespread application, discussions and actions by business and the responsible Federal agencies may find additional ways to deal with specific solvent preparations. Nonintoxicating glues are on the market, but certain other commercial products require volatile solvents. A nonintoxicating volatile solvent has not yet appeared, and it may not be technically possible to develop one.

A promising approach that would not be excessively costly to industry would consist of the substitution of less toxic solvents for those known to cause organ pathology. Benzene, hexane, and methyl butyl ketone are substances that should be eliminated whenever possible from commercial products. Suitable and safer alternatives exist.

Limiting the sales of airplane glue to minors was one device used during the past 10 years by a number of jurisdictions. It is not known whether this effort at regulation had the desired result, or whether it resulted in a shift to other intoxicants. The volatile nitrites are a group that exist in a regulatory limbo at this time. There seems to be little justification for their uncontrolled sale in adult shops except for purposes of intoxication. At the present time, they are being labeled as room deodorizers.

Community information and thoughtful action and education about solvents within the context of grade school health curricula are desirable preventive activities. Since peer pressures are so significant in inducing youngsters to become involved, peers should be utilized to prevent their abuse. Leaders could be selected and trained to emphasize alternate activities rather than promoting indulgence in dangerous drugs. A pilot project to test this hypothesis would be worthwhile.

There is a faddish quality to the use of specific products among solvent abusers. Early discovery of popular substances would be valuable in the prevention of miniepidemics of particularly harmful substances. Measures such as controlling supplies or appealing to the users via the media could be used to help avert the problem.

TREATMENT

The rehabilitation of chronic inhalant abusers is difficult since many of the antecedent causes of their overinvolvement relate to a disorganized personal, familial, or social existence. These problems must be dealt with, or cessation of inhalant use will only mean a movement to some other form of destructive behavior. There is a real need for a comprehensive, physical, and mental examination of the central and peripheral nervous system, the liver, kidney, lungs, and bone marrow in long-term inhalant abusers. Otherwise, reparable dysfunctions may be missed.

Since effective therapies are not at hand, future planning should include clinical investigations into potential promising procedures. Behavior modification techniques, conditioned aversion trials, and gratifying alternative activities are some leads that should be investigated. When these are combined with family therapy or peer-group psychotherapy, preliminary studies indicate a promise of a favorable outcome.

A small number of inhalant abuse clinics could be set up to serve multiple goals. (1) A good deal might be learned at such specialized clinics about the nature of the inhalant practice. (2) Special treatment techniques could be applied and evaluated there. (3) The specialized clinics would serve as training sites for treatment personnel, many of whose clients are intentional inhalant users.

TRAINING

Programs for training of treatment personnel who handle solvent abusers or whose caseload consists primarily of juveniles should be developed—perhaps as a training monograph from the National Drug Abuse Center for Training and Resource Development. As suggested previously, use of peer leaders and counselors may be the best way to engage and retain the persistent solvent abuser in therapy. Naturally, such young people, whose contact points might be in the school, the playground, the park, or the street, would require training and close supervision.

SUMMARY

The intentional inhaling of commercial solvents is a practice of adolescents and young adults, particularly of certain ethnic groups. Precise statistical information is difficult to obtain. Peer group influences appear to be a powerful factor in the initiation and perpetuation of volatile solvent abuse. Other contributory factors in sustaining the practice are social, familial, and intrapsychic disruption.

The acute state is reminiscent of acute alcohol intoxication. Self-directed and other aggressive behavior are known accompaniments to both states. About half of the chronic sniffers have been found to have a chronic brain deficit on neuropsychological testing. Of the specific solvents, some are known to be toxic. Carbon tetrachloride, benzene, hexane, and leaded gasoline are examples. Other solvents may be injurious either because of their ingredients or because of the way they are used.

Current trends include an increased number of female sniffers, an extension of the age range, and a combined use of inhalants with other drugs. The aliphatic nitrites have very recently shown a marked increase in popularity.

Future research directions should include improved epidemiological information and in-depth studies of high-risk populations. The issue of brain dysfunction in chronic users should be resolved with further research. Long-term animal studies mimicking the human abuse situation could be helpful.

Supply reduction is a difficult problem with the solvents since they are so widely available, but the more dangerous ones ought to be eliminated from commercial usage. The environmental concerns about aerosols may be an excellent opportunity to reduce the personal toxicity of spray-can abuse. Exchange of information with manufacturers might lead to improving the safety of the more dangerous preparations. Community education and the judicious supply of early information to school children about the volatile hydrocarbons may be worthy preventive efforts.

The treatment of the consistent user of solvents is admittedly difficult. Whether hitherto untried techniques such as behavior modification or conditioned aversion would provide improved results should be tested. The establishment of a few special study solvent abuse clinics is desirable from treatment, training, and research viewpoints.

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20. Amphetamines/Anorectics

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INTRODUCTION

Considering the incidence of stimulant use and misuse, there has been a dearth of clinical studies (or, indeed, in-depth human studies) involving amphetamines and anorectics. One could certainly question whether increased priorities in the area are not warranted. The greatest productivity in the past 5 years has been in basic research; overall, this contribution has been substantial. Therefore, this chapter will emphasize a review of the basic research and its implications for clinical and policy concerns.

MAJOR LEGAL SUPPLY: ANORECTIC USE

This review will focus on the use of prescription stimulants for anorectic indications—by far their most common use. For example, data from the National Disease and Therapeutic Index (IMS America 1976a) demonstrate that prescriptions for amphetamines, including Eskatrol, Dexedrine, Dexamyl, Biphetamine, and Desoxyn, have an anorectic indication approximately 90 percent of the time. Although there has been a remarkable drop from over 20 million (in 1970) to 5 million prescriptions per year for amphetamines, there has been little change in the prescription level since 1973. Prescription of other anorectics has risen from approximately 8 million to 14 million prescriptions per year (Food and Drug Administration 1977).

There are two questions pertinent to stimulant misuse: (1) Does prescription of stimulant anorectics to individuals over a short (or, alternatively, a chronic) period of time lead to a substantial pool of misuse recruits through introduction to the euphoric and energizing effects of these drugs? and (2) What is the level of diversion of legal amphetamines and anorectics into channels wherein these drugs will be abused? With regard to the first question, critical prospective studies of abuse liability of anorectic stimulants have not been accomplished.

Approximately 25 percent of amphetamine mentions in the DAWN System emergency-room reporting come from legal prescriptions, while 75 percent are attributed to other sources (e.g., street buys or thefts) (Food and Drug Administration 1977). The absolute amount of amphetamines diverted by means of poor medical practice or actual malpractice is unknown, but considered to be high.[1] Furthermore, in 1976 at least 5 million dosage units of amphetamines were stolen from pharmacies and their suppliers as well as physicians (IMS America 1976b). On the other side of the picture, only 2 percent of anorectics seized in drug arrests came from legitimate domestic manufacturers; the overwhelming number were identified as clandestinely manufactured (Drug Enforcement Administration 1976), and indicate that illegal manufacturers are certainly capable of taking up slack induced by controls.

Current levels of nonmedical use of prescription stimulants are greater than those for prescription sedatives or prescription tranquilizers, according to a NIDA survey conducted in 1975-76. Among young adults, nonmedical use of stimulants is second only to marihuana (Johnson et al. 1977). Anorectic stimulants are second only to sedatives and marihuana as the presenting primary drug of abuse for

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[1] Administrator, Drug Enforcement Administration: December 20, 1976. Letter to Commissioner of Food and Drugs, and attached DEA report, "Amphetamine Diversion."

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admissions to CODAP-monitored rural drug programs (National Institute on Drug Abuse 1977). Finally, Robins (Food and Drug Administration 1977) reports amphetamine as second only to marihuana misuse in a sample of veterans and nonveterans interviewed in 1974. Secondly, there is an increased incidence of current adjustment problems among those who are current users of amphetamines, and the maladjustment correlation for amphetamines is higher than for a number of other drugs, including heroin, barbiturates, various sedatives, and cocaine. The greater incidence of personality and adjustment problems among stimulant misusers is consistent with older studies (Ellinwood 1967).

Do We Need Anorectics?

One could certainly question whether anorectic drugs, especially those with high stimulant properties, are sufficiently efficacious to warrant their continued use. In fact, the FDA is currently considering removal of the anorectic indication for the labeling of amphetamine products. The FDA action has been conceived as an initial step with amphetamines, with the consideration that other substantially abused anorectic drugs will be removed from the anorectic indication. Thus, it is possible that many of the anorectic drugs will be soon removed from the market.

On the other hand, the cost/benefit formulation for anorectics must consider the increased mortality and disease morbidity resulting from obesity. The increased mortality rates for overweight persons are substantial (Shepard et al. 1960), and morbidity for hypertension, diabetes, and cerebrovascular and coronary artery disease are much greater (Kannel et al. 1967; Heyden et al. 1971; Shepard et al. 1960; Marks 1960; Society of Actuaries 1959a, b).

Since obesity contributes significantly to mortality, promotion of the selective and discriminant use of anorectics is preferable to a total ban on these drugs. Although most studies have demonstrated efficacy for anorectics at the level of 0.5 to 1 lb. weight loss per week for 3 to 6 weeks duration (Scoville,[2] Craddock 1976; Bray 1976), there have been no studies that have attempted to discriminate the patient factors associated with success in using a given type of anorectic and/or combination of other treatments. Although anorectic treatment does not provide for a sustained weight loss, neither do other forms of weight control (Leon 1976). Preliminary studies indicate that overweight patients who use diet pills are typically ones who have had more difficulty in using other methods of losing weight, but there is no evidence of greater drug misuse in this group than in other groups of overweight patients (Angle et al. 1978).

Current basic research indicates that the biochemical mechanisms underlying eating behaviors, although complex, are on the threshold of detailed elucidation. Research in this area is critically important and will lead to the development of new anorectic drugs with less abuse potential, and may also provide a basis for more specificity in prescribing the anorectics we have now. For example, the anorectic effects of amphetamines are related to at least two neurotransmitter systems. 6-Hydroxydopamine lesions of the ventral noradrenergic bundle to the hypothalamus, which destroyed 90 percent of the noradrenergic terminals (but dopamine terminals only slightly); blocked amphetamine-induced anorexia (Ahlskos 1974; Ahlskos and Hoebel 1973). Despite the specific noradrenergic findings, evidence is accumulating that bilateral lesions of the dopaminergic nigrostriatal system in the rat induce the same aphagic-adipsic syndrome as reported for the classical lateral hypothalamic lesions (Marshall and Teitelbaum 1973; Fibiger et al. 1973; Carey and Goodall 1975). Indeed, the lateral hypothalamic syndrome effects could be attributed to damage of the nigrostriatal fibers that pass by this area. Moreover, Carey and Goodall (1975) found that unilateral lesions of the nigrostriatal bundle were as effective as lateral hypothalamic lesions in attenuating amphetamine anorexia, and both lesions similarly depleted dopamine and, to a lesser extent, norepinephrine.

Ring substitution on the phenylethylamine nucleus (as in such compounds as fenfluramine and chlorphentermine) appears to create pharmacological characteristics that act on yet another anorectic mechanism, probably through serotonergic stimulation. Serotonergic antagonists (Funderburk et al. 1971; Jespersen and Scheel-Kruger 1973; Blundell et al. 1973) and serotonergic neuron lesions (Saminin et al. 1972; Clineschmidt 1973) inhibit fenfluramine anorexia. At least part of the fenfluramine effect appears to be as a direct serotonergic agonist, since serotonin depletion with parachloro-phenylalanine does not block the effect.

The pharmacological dissociation between amphetamine and fenfluramine illustrates the potential for specific manipulation of different mechanisms contributing to energy metabolism and eating behaviors via independent catecholamine and serotonin mechanisms. For example, the serotonergic effect appears to differentially depress the nonprotein calorie intake (Wurtman and Wurtman 1977). In contrast, the ring-substituted anorectics lack the robust stimulant (catecholaminergic) effects, and in fact appear to have sedative action (Griffith et al. 1975). They do not activate locomotor activity (Van Rossum and Simons 1969). Fenfluramine has none of the amphetamine-type thermogenic properties (Bizzi et al. 1970). The energy-balance formulation has at least three elements—intake, thermogenesis, and work-activity expenditure (Mann 1974a, b)—which is rarely considered when prescribing the "anorectics."

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[2] B. Scoville 1972, personal communication.

Not appreciating that the factors maintaining obesity represent a heterogeneous group of conditions has, in the past, led to nonselective use of amphetamine/stimulant-type anorectics. Conversely, we do not know whether there are certain individuals who may respond very specifically to the stronger stimulant drugs, which are potent dopamine releasers. For example, there are individual differences in postprandial thermogenesis, which can lead to use of 7 percent to 10 percent of ingested energy (Miller et al. 1967). When a meal is followed by exercise, there is a doubling of the thermic effect. Thus, the thermogenic and activity-inducing effects of amphetamine-type anorectics may provide a more specific treatment for certain individuals. In addition, activation of the nigrostriatal system may involve the induction of arousal behaviors that compete with eating. Obviously, the risk/benefit ratio will need to be considered, since fenfluramine has little abuse liability. It is not self-administered by rats (Baxter et al. 1973) or monkeys (Woods and Tessel 1974), and there have been no reports of addiction in humans.

Based on the abuse liability of the stronger anorectics (amphetamines and phenmetrazine) to be discussed later, it would not be unreasonable for the FDA to discontinue the anorectic indication with the full understanding that the FDA's interpretation of regulations (Edwards 1972) still permits individual physicians to prescribe these drugs when other anorectics have been inefficacious, or when there are patient-specific indications. Removal of the general indication would block ordering of stronger stimulants in massive amounts by unscrupulous physicians, and would preclude routine prescribing as the first drug tried in an anorectic regime. If, over time, specific applications for stronger stimulant anorectics were documented, then a more narrowly drawn anorectic indication could be approved. Since all of the side-chain-substituted anorectics have various gradations of stimulant properties, we can expect reduction of amphetamine supplies to be associated with increased abuse of other anorectics. Thus, rescheduling of some of these compounds will probably ensue.

ABUSE POTENTIAL

In order to define more accurately the abuse characteristics of amphetamine-type drugs, it helps to distinguish between abuse potential and what this author has described as "abuse involvement" and "abuse persistence" (Ellinwood 1973). Abuse potential is defined as the tendency for a certain percentage of individuals taking amphetamines to fall into abuse patterns. Clinical impressions indicate that abuse potential is influenced by: (1) route and dose of administration (case histories indicate that intravenous use can be associated with a very short latency to an abuse cycle); (2) subcultural or group reinforcement of the drug use; (3) early age of initiation; (4) early establishment of a drug-induced exhaustion cycle, usually dependent upon high dose and extended duration of drug use cycle; and (5) use by individuals with chronic fatigue and psychasthenia.

Abuse involvement is used to describe the degree to which an individual who has established an abuse pattern is overwhelmingly involved with the use of amphetamines in the face of known devastating and dangerous effects. A marked degree of abuse involvement implies that the individual is unable to voluntarily pull himself out of this pattern of use, and often can do so only after an abrupt altercation, incarceration, or psychotic experience. Although this type of overwhelming involvement is noted after oral use, it is much more characteristic of intravenous use. There are no recent studies documenting the individual and environmental factors contributing to abuse involvement.

The properties of individual anorectics have been examined. Griffith and his colleagues (Griffith et al. 1975; Griffith 1977) have extensively tested most of the anorectics for their stimulant, euphoriant, and preference properties in addicts "blind" to the drug. In general, the results follow clinical impressions, in that amphetaminelike compounds have the highest preference, with appropriate gradations down to the ring-substituted amphetamine analogs (fenfluramine and chlorphentermine), which apparently do not have any major psychostimulant or sympathomimetic effect. These drugs are perceived as sedatives without euphoriant properties. A word

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of caution is needed for fenfluramine, in that high doses induced psychotomimetic effects (Griffith 1977; Gotestam and Gunne 1972); that is, visual and olfactory hallucinations, rapid mood swings, distorted time sense, and fleeting paranoia (Griffith et al. 1975). These psychotomimetic effects of fenfluramine should be carefully evaluated, since there is one report of misuse of fenfluramine as an hallucinogen in South Africa (Levin 1973). There have not been similar reports in the United States.

A major gap in our information base is the absence of any prospective studies of abuse latency and incidence in patient populations receiving anorectics; there are no adequate retrospective studies of abuse incidence. Policy decisions could be more specific with such information, since the abuse incidence [illegible] the prescribed-to population could be separated from nonmedical or illicit use. If, for example, a low incidence is found in medical users, then greater effort could be expended on preventing diversion than on reduction of medical indications.

Abuse persistence is defined as the abuse pattern's long-term tenacity on the individual. As with narcotics, sedatives, and alcohol, amphetamines demonstrate some capacity for a resolute grip on the individual, even after long periods of abstinence. This stubborn, enduring quality of the stimulant habit does not appear to be as great as that of heroin (or even alcohol) after 1 or 2 years. Case histories demonstrate a tendency for the amphetamine habit to "burn out" within 1 to 2 years, although some abusers will continue in a sustained pattern for years. In contrast, the heroin addict (Vaillant 1973; Winick 1962) and alcoholic are generally considered to take 8 to 16 years to "burn out" or run their course. Unfortunately, there are no followup studies to document the natural history of stimulant abuse.

Psychomotor Stimulants as Reinforcers: Basic Research

Considerable importance to a general theory of drug abuse has been assigned to psychomotor stimulants as reinforcers. Since stimulants do not induce severe physiological dependence and withdrawal, the more isolated reinforcing effects are thought to contribute significantly to the stimulants' abuse potential. Currently, one of the most common means of routinely establishing the preclinical reinforcement characteristics of drugs is the self-administration paradigm in animals. Basically this paradigm consists of demonstrating that an animal (e.g., monkey or rat) will work (lever press) for a drug injected through an indwelling intravenous catheter. New drugs that are readily self-administered by monkeys are held highly suspect for abusable reinforcing properties in humans until proven otherwise. The reinforcing potency of drugs has been analyzed in a variety of schedules, including (1) choice procedures (between two drugs and/or doses) (Johanson and Schuster 1975; Balster and Schuster 1977), and (2) cost-response analysis (e.g., the breakpoint of increasing work effort where the animal will no longer perform to obtain the drug dose) (Brady and Griffiths 1977). To date, most of the side-chain-substituted amphetamine-analog anorectics appear to have some stimulant potency, when tested in self-administration paradigms and in other tests for stimulant properties. Although weaker than dextroamphetamine and methamphetamine (as well as phenmetrazine), these compounds would appear to have sufficient stimulant reinforcing properties to be abused by some individuals. As stated previously, ring-substituted anorectics, especially fenfluramine, are weak or ineffectual as self-administration reinforcers.

Furthermore, drug-seeking behaviors can be analyzed with techniques utilized for assessing other operant behaviors, even though there is no consistent theoretical formulation that explains why any event acts as a reinforcer (Morse and Kelleher 1970). Instances in which the same consequence event under differing experimental schedules can induce diametrically opposite results render simple concepts of reinforcement naive (Morse et al. 1977; Lyon and Robbins 1975). For example, methamphetamine injection induces taste aversion when paired with a preferred saccharin solution in the rat at doses that are reinforcing in other paradigms (Martin and Ellinwood 1973; Carey 1973; Wise et al. 1976). The reinforcing efficacy of amphetamines and cocaine does appear to be in part mediated by catecholamines, especially dopamine, in that alpha-methyl-tyrosine (αMT) and pimozide both increase rates of responding to a given unit dose, in self-administration paradigms (Pickens et al. 1968; Schuster and Wilson 1972; Yokel and Wise 1975). Furthermore, rats will self-administer apomorphine, a direct dopamine agonist (Baxter et al. 1973). Consistent with the evidence of dopamine-mediated amphetamine reinforcement effects are reports that amphetamines and apomorphines facilitate electrical self-stimulation "reward" areas of the brain and that dopamine antagonists block self-stimulation at doses where a dissociation from arousal attenuation effects of the antagonist can be made (Rolls et al. 1974; Fouriezos and Wise 1976). Antelman and Caggiula (1977) have proposed a norepinephrine-dopamine interaction for reinforcing effects, since inhibition of norepinephrine synthesis or lesions of the locus ceruleus facilitate lateral hypothalamic self stimulation (Fuxe et al. 1974; Koob et al. 1976).

From a theoretical and potentially practical viewpoint, it is important to realize that not all drugs potentiating catecholamines (or even dopamine alone) have the euphorigenic properties. Understanding the biochemical similarities and differences of reinforcing stimulants could be quite useful in predicting abuse potential of new compounds as well as in designing new nonabused drugs.

Amphetamines and several of the more potent psychomotor stimulants (including methamphetamine and phenmetrazine) act by selectively releasing newly synthesized catecholamines, in that αMT—which inhibits tyrosine hydroxylase and thus the synthesis of catecholamines—markedly inhibits the ability of these compounds to induce central stimulant effects (Dominic and Moore 1969a, b; Scheel-Kruger 1971; Scheel-Kruger et al. 1977; Thornburg and Moore 1973; Sayers and Handley 1973). On the other hand, αMT is unable to block the central stimulant effects of methylphenidate, pipradol, amfonelic acid, nomifensine, or cocaine (Kopinger 1958; Wallach and Gershon 1972; Scheel-Kruger 1971, 1972; Dominic and Moore 1969b; Thornburg and Moore 1973). In contrast, the action of psychomotor stimulants of the amphetamine type is not blocked by prior treatment with reserpine, which does block the action of the methylphenidate, pipradol, amfonelic acid, and cocaine group (Scheel-Kruger 1971; Wallach 1974).

Confirmatory evidence from studies of labeled tyrosine infusions into the lateral ventricle indicated that dopamine efflux following an amphetamine pulse into the ventricle was blocked by αMT. Previous treatment with reserpine, on the other hand, appeared to actually enhance the amphetamine-induced release, whereas it blocked the methylphenidate-induced release of newly synthesized labeled dopamine (Chiueh and Moore 1974a, b, c, 1975a, b).

Many stimulants, including d- and l-amphetamine, methamphetamine, methylphenidate, pipradol, and cocaine, have potent catecholamine reuptake blocking actions (Ferris et al. 1972; Hendley et al. 1972). The stimulant cocaine, like the tricyclics (e.g., desipramine), is similar to amphetamine in its capacity to block reuptake of norepinephrine, but is a weak in vitro (Azzaro et al. 1974; Heikkela et al. 1975) and in vivo (Carr and Moore 1970) releaser. The catecholamine reuptake blocking action may potentiate the stimulant effect, but certainly is not the central mechanism underlying the characteristic stimulant behavioral effects (Scheel-Kruger 1972; Scheel-Kruger et al. 1977). Tricyclic antidepressants are potent norepinephrine reuptake inhibitors (Koe 1975) and benztropine is a potent dopamine uptake blocker (Coyle and Snyder 1969), yet neither induces stereotypy or pronounced locomotor activation in animals. Furthermore, they do not induce the characteristic "euphoria," nor are they subject to abuse in man. Analogously, the monoamine oxidase (MAO) inhibiting actions of amphetamines do not appear to independently contribute to the stimulant effects, since many potent MAO inhibitors do not induce the characteristic stimulant behaviors. Tranylcypromine, an amphetamine analog, has a strong MAO inhibiting capacity as well as some stimulant effects. Most stimulants are not potent MAO inhibitors; like reuptake block, this mechanism may only contribute to the main stimulant effect at higher doses.

In summary, even at present, alteration of the amphetamine molecule has contributed new drugs as well as an understanding of mechanisms. For example, adding methyl groups onto the side chain inhibits MAO degradation and can even induce MAO inhibition. Halogen substitution on the phenyl ring (e.g., fenfluramine) reduces arousal activation but leaves strong anorectic action through a serotonergic mechanism. Other substitutions induce psychotomimetic activity, reduce arousal and reinforcement effects, or change the stimulant's mode of action in activating catecholamine effects while maintaining reinforcing effects (e.g., methylphenidate and cocaine). Basic research efforts may have considerable payoff if we could understand why a drug such as cocaine, which is thought to act primarily through block of catecholamine reuptake like several nonabused drugs, is such an overwhelmingly potent reinforcer when administered intravenously.

Finally, the self-administration paradigms have been consistent with human case studies in demonstrating a marked stimulant abuse potential and involvement associated with intravenous administration. Rats and monkeys will not only administer remarkably large amounts of the stronger stimulants (including cocaine) after only a brief experience with the drug, but will continue to self-administer even though lethal toxic effects have ensued (Deneau et al. 1964; Pickens 1968; Schuster and Thompson 1969; Balster and Schuster 1973; Aigner and Balster 1978).

So far, there has not been a successful oral drug self-administration paradigm established in laboratory animals, except using intragastric intubation.

The difficulties in establishing this paradigm in experimental animals argue for caution in generalizing from intravenous self-administration paradigms to the abuse potential and involvement for oral use of anorectics in man. However, these paradigms do have a substantial role as preclinical indicators of abuse potential.

BEHAVIORAL TOXICITY INDUCED BY STIMULANT ABUSE

Although acute high-dose amphetamine use may induce a toxic hallucinatory state, by far the major behavioral alteration is the chronic amphetamine psychosis which occurs in a state of clear consciousness. Usually, the hallmark of the psychosis is paranoid symptomatology, which includes visual, auditory, and olfactory hallucinations, delusions of persecution, ideas of reference, and body-image changes. Dyskinetic and dystonic reactions have also been described (Schiorring 1977; Ellinwood 1973). Once the psychosis is manifested, certain symptoms (e.g., delusions) may persist, and the individual has a lower threshold for precipitation of psychosis with subsequent amphetamine use, even after long intervening periods of abstinence (Ellinwood 1973; Kramer 1969; Bell 1973; Utena 1974). Abstinent former abusers have been described as apathetic and psychasthenic (Utena 1966; Ellinwood 1973).

Pathological Substrate of Amphetamine Toxicity

High-dose intravenous users suffer from all the problems of dirty needle use (e.g., sepsis and emboli). In addition, the acute overdose hypertensive crisis can precipitate cerebrovascular accidents. On the basis of human and animal studies, Rumbaugh (1977) raised the issue of a specific microvascular insult from chronic stimulant intoxication. In animal studies, neuronal chromatolysis, primarily in catecholamine neuron areas (Duarte-Escalante and Ellinwood 1970, 1972), and a striking permanent depletion (70 percent) of dopamine in the caudate (Seiden et al. 1977), have been demonstrated following chronic amphetamine intoxication. This evidence of chronic depletion of catecholamine is potentially important for an understanding of (1) the anergia noted in former addicts; and (2) the prerequisites of postjunctural supersensitivity (discussed below). It also raises the nagging question of whether chronic treatment of hyperactive children with moderately high doses (over 1 mg/kg) of amphetamines may have residual effects. Consistent with the chronic behavioral changes noted for humans, there is a plethora of laboratory data demonstrating that a given stimulant dose induces quantitatively and qualitatively different behaviors than noted with original acute doses. These chronic stimulant intoxication end-stage behaviors include hyperreactive "startle" behaviors, postural abnormalities, and dyskinesias noted in monkeys and cats (Ellinwood 1971a; Ellinwood and Kilbey 1975), and response augmentation in rats and guinea pigs (Segal and Mandell 1974; Klawans and Margolin 1975; Kilbey and Ellinwood 1977a, b; Stripling and Ellinwood 1977a, b); the increased responsivity is noted to persist for several weeks after cessation of chronic treatment. The dyskinesias induced take on considerable relevance, in that Eibergen and Carlson (1975) demonstrated that chronic treatment with methadone induces a long-term supersensitivity manifested as amphetamine-induced dyskinesias, at doses which do not have this effect generally. The fact that some methadone maintenance patients abuse amphetamines renders this an important finding requiring careful followup.

The mechanisms underlying these chronic changes are under continuing investigation. Chronic cocaine intoxication is associated with increased electrophysiological response in the amygdala and lowered seizure threshold (Stripling and Ellinwood 1977b). Chronic amphetamine intoxication renders caudate neurons more sensitve to a direct dopamine agonist consistent with the induction of a postsynaptic supersensitivity (Groves and Rebec 1977). Keeping in mind the amphetamine depletion effects described above, it has been demonstrated that experimentally induced lesions and catecholamine depletion are sufficient to establish supersensitivity (Creese et al. 1977; Segal et al. 1974). On the other hand, Burt et al. (1977) did not find increased postsynaptic binding following chronic amphetamine intoxication. More recent studies of chronic cocaine intoxication in cats have indicated that it is important to consider the ratio of depleted neurotransmitters and that clozapine, a noncataleptic neuroleptic, was more effective in blocking bizarre behaviors than comparable doses of pimozide, a potent dopamine receptor blocker (Ellinwood and Kilbey 1977).

Pharmacokinetic variables have typically been overlooked in past chronic studies. Castellani et al. (1978a, b) have demonstrated that reverse tolerance for electrophysiological responsivity and seizures to cocaine is absent when the intravenous route of administration is used, again underscoring the necessity of not generalizing across routes of administration. Chronic intraperitoneal administration of amphetamines increases uptake of the last dose into the brain, including a marked increase in striatum and pons (Kuhn and Schanberg 1977). In addition, amphetamines accumulate in tissues during chronic administration. This was further elaborated by Sparber et al. (1977), who reported that chronic amphetamine administration results in 60 percent higher concentrations in adipose tissue than after acute injections. Furthermore, moderate stress mobilized the drug stores and led to doubled brain levels of amphetamines in the chronic animals, whereas the acute animals did not show this response.

Stress-induced release of mobilizable storage pools may help explain the "conditioned responses" of chronic experimental animals (Ellinwood and Kilbey 1975), as well as the sudden panic states (at times with violence) of chronic amphetamine abusers when subjected to real and imaginary stress (Ellinwood 1971b).

TREATMENT OF STIMULANT ABUSE

Certainly these intense abuse involvement, behavioral toxic consequences (as noted, especially, with high-dose intravenous use) warrant an aggressive treatment approach. Hospitalization for intense treatment is indicated where possible. However, there are no controlled treatment studies to guide the clinician's efforts (obviously, these are a priority need). Tricyclic antidepressants have been efficacious in individual cases for treating the postamphetamine chronic fatigue, psychasthenia, and irritability that may wax and wane for months after cessation of amphetamine use (Ellinwood 1977). Any means of behavioral control over subsequent use is important, yet it does not seem warranted to invest great sums in development of potential antagonists, as has been suggested from time to time. The review of stimulant pharmacological mechanisms demonstrates that more than one presynaptic mechanism is involved for different stimulant types, rendering it quite difficult to develop antagonists with specific sites of action. We are not dealing with a more direct receptor agonist-antagonist mechanism, but with a multiplicity of mechanisms. Attempts at a general catecholamine inhibition would be fraught with multiple side effects, including psychomotor retardation, dysphoria, and (potentially) depression in populations that frequently complain of fatigue and psychasthenia. Thus, treatment development efforts need to primarily emphasize early identification and behavioral involvement and control.

SUMMARY

Not appreciating that the factors maintaining obesity represent a heterogeneous group of conditions has, in the past, led to nonselective use of amphetamine/stimulant-type anorectics for this condition. Since obesity contributes significantly to mortality, promotion of the selective and discriminant use of anorectics is preferable to a total ban on these drugs. To date, the majority of anorectics consisting of side-chain-substituted analogs (in contrast to ring-substituted), when tested in self-administration paradigms and in other tests for stimulant properties, all appear to have some stimulant potency. The self-administration paradigms have been consistent with human case studies in demonstrating a marked stimulant abuse potential and involvement associated with intravenous administration of stimulants. Understanding the biochemical similarities and differences of reinforcing stimulants could be quite useful in predicting abuse potential of new compounds as well as in designing new nonabused drugs. Both clinical and laboratory observations demonstrate chronic changes (and, not infrequently, residual pathology) with long-term intoxication. Review of stimulant pharmacological mechanisms demonstrates that more than one presynaptic mechanism is involved for different stimulant types, rendering it quite difficult to develop antagonists with specific sites of action. Treatment development efforts need to primarily emphasize early identification with behavioral involvement and control. Withdrawal-induced depression may require pharmacological treatment.

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230

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21. The Abuse of Barbiturates and Other Sedative-Hypnotics

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Barbiturates and other sedative-hypnotics are the most widely prescribed psychoactive drugs in the United States. Diazepam (Valium) is the most commonly prescribed drug in the country. Although barbiturates and other sedative-hypnotics are widely abused, there is a differential rate of abuse between the various sedative-hypnotics. Abuse is also associated with differing risk. For example, the large number of deaths from barbiturate overdose which occur each year attests to their lethality. However, the benzodiazepines, which are more widely available, are rarely associated with overdose death when used alone. All sedative-hypnotics, including the nonbarbiturate sedative-hypnotics, such as methaqualone (Quaalude) or chlordiazepoxide (Librium), can produce physical dependence and a barbituratelike withdrawal syndrome with the threat of convulsion if the drug is taken in sufficient dosage over a long enough time period. As barbiturates are the prototype for sedative-hypnotics, we will focus on them with discussion of the special characteristics of the other compounds as appropriate for this chapter.

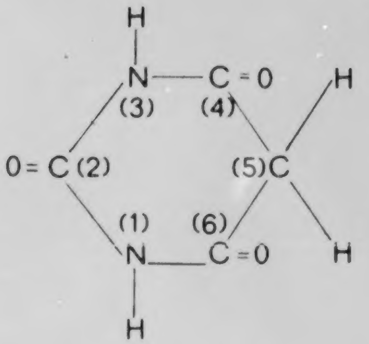
The availability of barbiturates, a technological improvement over the previously used bromides, for treatment of anxiety and insomnia has improved the quality of life for hundreds of thousands of individuals throughout the world. These sedative-hypnotics are also important adjuncts to surgical anesthesia, while phenobarbital is often the drug of first choice in the treatment of major motor seizures. These benefits notwithstanding, barbiturates—especially secobarbital and pentobarbital—have become the most common drugs of abuse after alcohol and tobacco, involving more individuals than the widely publicized heroin epidemic.

The information presented in this overview of barbiturates and other sedative-hypnotics is discussed in greater detail in Barbiturates: Their Use, Misuse and Abuse (Wesson and Smith 1977); Diagnosis and Treatment of Adverse Reactions to Sedative-Hypnotics (Smith and Wesson 1974); and Uppers and Downers (Smith and Wesson 1973).

Among the sedative-hypnotics, barbiturates comprise a class of chemical compounds that are derivatives of barbituric acid, first synthesized by Nobel Prize winning German chemist Adolph Baeyer in 1863. Conrad and Guthzeit synthesized 5,5-diethylbarbituric acid (barbital) in 1882, and Emile Fischer and Baron Joseph von Mering introduced barbital into clinical medicine under the trade name Veronal in 1903, thus initiating an era of widespread barbiturate use.

Different barbiturates are made by substituting various chemical structures at positions 3 and 5 (see figure 1). These can be classified by duration of pharmacological effects, primary medical uses, and generic/trade names of the most often prescribed barbiturates in the United States: ultra-short-acting (¼-3 hours) anesthetic induction (thiopental/Pentothal); short-acting (3-6 hours) hypnotic, sedative (preoperative), injected for rapid seizure control (amobarbital/Amytal, pentobarbital/Nembu-

FIGURE 1.—*Barbituric acid*



tal secobarbital/Seconal); intermediate-acting (6-12 hours) daytime sedative (butabarbital/Butisol); long-acting (12-24 hours) control of epilepsy, daytime sedative, treatment of sedative-hypnotic withdrawal (phenobarbital/Luminal). In usual clinical doses the primary site of action of barbiturates is the central nervous system (CNS). Barbiturates produce depression of the CNS ranging from mild sedation to coma, with the degree of depression dependent upon the particular barbiturate, the individual's barbiturate tolerance, the dose, the route of administration, and the state of excitability of the nervous system. Individuals in the manic phase of manic-depressive illness tolerate large amounts of barbiturates without sedation (Sapira and Cherubin 1974), as do individuals who have ingested amphetamines (Greenwood and Peachey 1957).

Intoxication with barbiturates is qualitatively similar to intoxication with alcohol. The exact effects of barbiturate intoxication vary from time to time, even with the same individual. The desired effect is generally one of "disinhibition euphoria," a state in which mood is elevated; self-criticism, anxiety, and guilt reduced; with a feeling of increased energy and self-confidence. While euphoria may occur with sedative-hypnotics, the mood may be quite labile and the individual may also experience sadness, rapidly fluctuating mood shifts, irritability, hypochondriacal concerns, increased anxiety, and agitation. It is the euphoria of short-acting barbiturates and certain other sedative-hypnotics which makes them appealing as intoxicants. The state of disinhibition euphoria is not necessarily synonymous with intoxication.

Individuals intoxicated with phenobarbital commonly show unsteady gait, slurred speech, sustained vertical and horizontal nystagmus, and poor judgment, but their subjective state frequently is reported to be unpleasant or "dysphoric." The perception of a drug effect as pleasurable is in part a learned response and in part the pharmacology of the drug, but it is always influenced greatly by expectation and environmental stimuli. Our estimates of the ability of barbiturates and other sedative-hypnotics to produce a disinhibition euphoria state is compared in table 1. In most cases, disinhibition occurs at dosages above those commonly prescribed.

Regardless of the mood effects, intoxication produces a reduction in the ability to make accurate judgments and markedly impairs motor coordination. Barbiturates are well absorbed from the stomach, but the short-acting ones absorb more readily than the longer acting ones. Alcohol enhances absorption and produces an additive sedative-hypnotic effect. The sodium salts of barbiturates can be injected intramuscularly or intravenously, although the solutions, including those prepared by pharmaceutical companies specifically for injection, are very alkaline. They are distributed throughout the body and cross the placental barrier within a few minutes after injection. The short- and intermediate-acting barbiturates are transformed in the body to inactive metabolites by the liver. Phenobarbital is partly metabolized by the liver, but is also excreted in significant amounts unchanged in the urine.

Sedative-hypnotics can produce psychological dependence, physical dependence, and tolerance. Psychological dependence refers to a strong need to experience the drug effect repeatedly, even in the absence of physical dependence. Physical dependence refers to the establishment of objective signs of withdrawal which occur after the drug is abruptly stopped, and tolerance refers to the adaption of the body to the drug in such a manner that larger doses are required to produce the original effects. With barbiturates, tolerance of two types develops. Drug-disposition tolerance develops from activation of drug-metabolizing enzyme systems in the liver capable of destroying barbiturates more rapidly (Remmer 1969). Pharmacodynamic tolerance is due to the adaption of the CNS to the presence of the drug. As the individual increases the dose to maintain the same level of intoxication, the margin between the intoxicating dose and the lethal dose becomes smaller.

Some individuals are prone to overuse any drug which will lessen their worries or anxieties. The intent of

TABLE 1.–*Clinical estimates of ability of intoxicants to produce disinhibition euphoria*

Generic name	Common trade name	Estimated ability to produce disinhibition euphoria at an intoxicating dose
Alcohol	Many brand names	++++
Amobarbital	Amytal	++++
Butabarbital	Butisol	++
Chloral hydrate	Aquachloral Supprettes	++
	Felsules	
	Kessodrate	
	Noctec	
	Rectules	
	Somnos	
Chlordiazepoxide hydrochloride	Libritabs	++
	Librium	
Diazepam	Valium	+++
Flurazepam hydrochloride	Dalmane	+
Glutethimide	Doriden	+++
Meprobamate	Equanil	+++
	Kello-Bamate	
	Meprospan	
	Meprotabs	
	Miltown	
	SK-Bamate	
Methaqualone	Optimil	++++
	Parest	
	Quaalude	
	Somnafac	
	Sopor	
Methyprylon	Noludar	+++
Pentobarbital	Nembutal	++++
Phenobarbital	Eskabarb	+
	Luminal	
	Solfoton	
	Stental	
Secobarbital	Seco-8	++++
	Seconal	
Secobarbital and amobarbital	Tuinal	++++

NOTE.–Table based on the authors' clinical estimation of propensity to produce disinhibition euphoria. (+ = small tendency to produce disinhibition euphoria to ++++ = a high tendency). Dosages required to produce inhibition are typically larger than that commonly prescribed and are usually associated with intoxication.

their drug usage is to maintain an anxiety-free state. These individuals are generally 30 to 50 years old and are likely to be introduced to barbiturates by physicians who prescribe these drugs as "mild tranquilizers" or "sleeping pills." Most of these individuals have no identification with youthful drug-using subcultures. However, they find that barbiturates make coping with life easier and, as tolerance to the tranquilizing and sedative effects develops, they increase their dose—often without their physician's knowledge. It is this tendency to escalate dosage against medical advice which distinguishes these individuals from those who advantageously use sedatives to reduce excessive anxiety or stress. Because they may see several physicians, none of whom may be aware that the patient is abusing the barbiturates prescribed, these individuals' drug abuse may go unidentified for some time until confusion, irritability, decreased ability to work, and episodes of acute intoxication with slurred speech and staggering gait finally draw attention to their drug usage.

An episodic abuse pattern is seen most commonly in teenagers and young adults. Sufficient amounts of barbiturates (100 to 200 mgs) are taken orally to produce a "high" or disinhibition intoxication in much the same manner as others use alcohol. Sometimes the sedatives are combined with alcohol.

Barbiturate capsules can be dissolved in water and injected primarily for the "rush" effect—a warm, drowsy feeling experienced immediately after injection. The intravenous use is by far the most hazardous in that the user is exposed to the dangers of nonmedical-needle use as well as an accidental overdose with respiratory arrest and death. Intravenous barbiturate users are known as "barb freaks" within the drug-abusing subculture and occupy a low status within that culture. They may become so engrossed in their drug use that they neglect basic hygiene and nutrition.

Barbiturates are used in conjunction with stimulants to come down after abuse of amphetamines. Heroin addicts may supplement heroin with barbiturates when the supply of heroin is low, or unknowingly inject barbiturates because a dealer "cuts" the heroin with barbiturates (Hamburger 1964).

Barbiturates are associated with nearly 5,000 deaths each year and the barbiturate overdose represents a potential major medical emergency with life-threatening implications.[1] Patients who have overdosed on barbiturates or other sedative-hypnotics arrive at drug-treatment programs presenting a variety of signs and symptoms which must be interpreted quickly and accurately. A sedative-hypnotic overdose is a life-threatening emergency which cannot be treated definitively by nonmedical personnel. Signs and symptoms of sedative-hypnotic overdose include slurred speech, staggering gait, sustained vertical and/or horizontal nystagmus, slowed reactions, lethargy, and progressive respiratory depression characterized by shallow and irregular breathing leading to coma, and in sufficient dosage, death. Figure 2 outlines the ways in which an acute sedative-hypnotic overdose can be treated in an emergency-room setting.

Though the majority of patients who are treated for an overdose of sedative-hypnotics are acutely intoxicated or in coma following the ingestion of a single large dose, they are not physically dependent. Unless the sedative-hypnotic has been used daily for more than a month in an amount equivalent to 400 to 600 mgs of short-acting barbiturates, a severe withdrawal syndrome will not develop.

The medical aspects of barbiturate withdrawal are described in an excellent monograph, The Barbiturate Withdrawal Syndrome: A Clinical and Electroencephalographic Study (Wulff 1959). The barbiturate withdrawal syndrome was experimentally studied in humans by Isbell et al. (1950). Hollister et al. (1961) reported an experimental study of chlordiazepoxide (Librium), and Hollister et al. (1963) report an experimental study of diazepam (Valium). Clinical case reports include Swartzburg et al. (1973), methaqualone; Flemenbaum and Gumby (1971), ethchlorvynol (Placidyl); and Swanson and Okada (1963), meprobamate.

The sedative withdrawal syndrome can be conceptualized as a spectrum of signs and symptoms occurring after stopping the sedative. Symptoms do not follow a specific sequence, but can include anxiety, tremors, nightmares, insomnia, anorexia, nausea, vomiting, postural hypotension, seizures, delirium, and hyperpraxia. The syndrome is similar for all sedative-hypnotics; however, the time course depends upon the particular drug involved. With pentobarbital, secobarbital, meprobamate, and methaqualone, withdrawal symptoms may begin 12 to 24 hours after the last dose, and peak in intensity between 24 and 72 hours. The withdrawal reactions to phenobarbital, diazepam, and chlordiazepoxide develop more slowly and peak on the fifth to eighth day.

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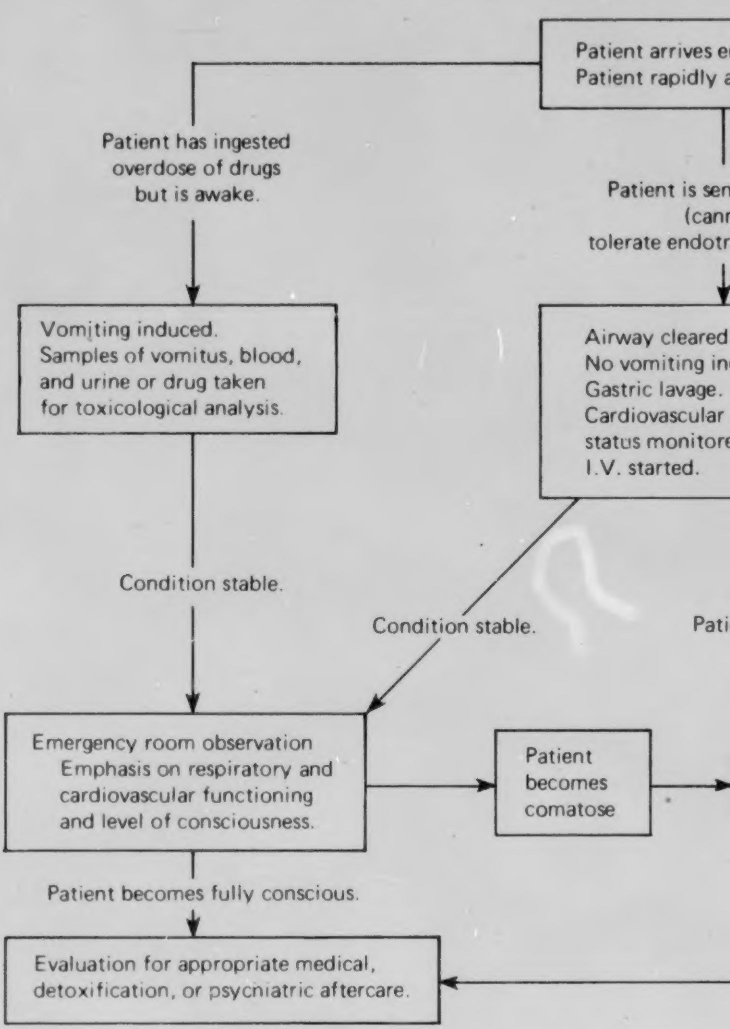
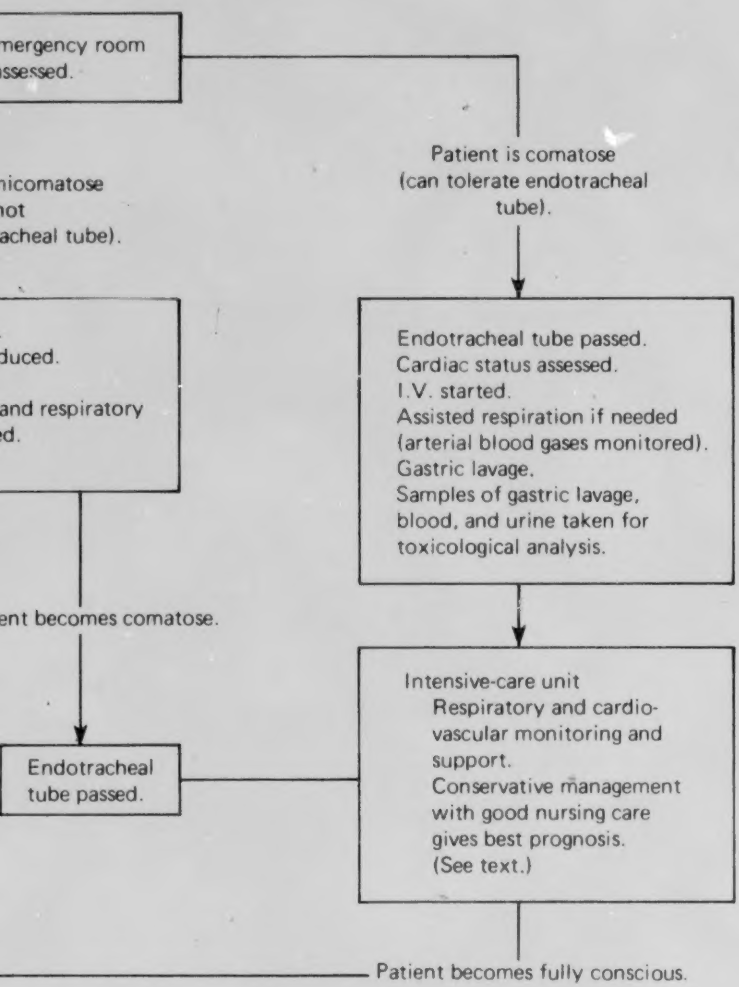
[1] Robert DuPont, interview in AMA News, December 12, 1977.

FIGURE 2.–*Barbiturate and other sedative-*



Patient arrives e
Patient rapidly a
Patient has ingested overdose of drugs but is awake.
Patient is sen
(cann
tolerate endotr
Vomiting induced.
Samples of vomitus, blood, and urine or drug taken for toxicological analysis.
Airway cleared
No vomiting in
Gastric lavage.
Cardiovascular
status monitore
I.V. started.
Condition stable.
Condition stable.
Pati
Emergency room observation
Emphasis on respiratory and cardiovascular functioning and level of consciousness.
Patient becomes comatose
Patient becomes fully conscious.
Evaluation for appropriate medical, detoxification, or psychiatric aftercare.

hypnotic overdose acute treatment diagram



mergency room
ssessed.
Patient is comatose
(can tolerate endotracheal
tube).
nicomatose
not
acheal tube).
duced.
and respiratory
ed.
Endotracheal tube passed.
Cardiac status assessed.
I.V. started.
Assisted respiration if needed
(arterial blood gases monitored).
Gastric lavage.
Samples of gastric lavage,
blood, and urine taken for
toxicological analysis.
ent becomes comatose.
Intensive-care unit
Respiratory and cardio-
vascular monitoring and
support.
Conservative management
with good nursing care
gives best prognosis.
(See text.)
Endotracheal
tube passed.
Patient becomes fully conscious.

During the first 1 to 5 days of untreated sedative-hypnotic withdrawal, the EEG may show a paroxysmal burst of high-voltage, slow-frequency activity which precedes the development of seizures. The withdrawal delirium may include disorientation to time, place, and situation, as well as visual and auditory hallucinations. The delirium generally follows a period of insomnia. Some individuals may have only delirium, others only seizures, and some may have both delirium and convulsion.

There are two major methods of detoxifying the barbiturate-dependent patient: (1) gradual withdrawal of the addicting agent on a short-acting barbiturate (Isbell et al. 1950), and (2) the substitution of long-acting phenobarbital for the addicting agent and gradual withdrawal of the substitute drug (Smith and Wesson 1970; Smith and Wesson 1971; Smith et al. 1978). Either method uses the principle of stepwise withdrawal. Abruptly discontinuing sedative-hypnotics in an individual who is physically dependent upon them is poor medical practice, and has resulted in death (Fraser et al. 1952), as well as malpractice suits (American Medical Association 1971). Although Isbell (1950) recommended that sufficient amounts of barbiturates be used during withdrawal to produce mild toxicity, we do not believe that production of toxicity is necessary to prevent emergence of severe withdrawal signs. We have found withdrawal with short-acting barbiturates difficult to control, as the dosage differential between mild toxicity and severe toxicity can be only one or two pills a day. However, some recent authors advocate using short-acting barbiturates (Sapira and Cherubin 1975).

The pharmacological rationale for phenobarbital substitution technique is similar to the rationale for substituting methadone for heroin during withdrawal. The longer acting drug permits a withdrawal characterized by fewer fluctuations in blood levels of the drug throughout the day and thus enables the safe use of smaller doses. The safety factor for phenobarbital is greater than that for the shorter acting barbiturates; lethal doses of phenobarbital are several times greater than toxic doses and the signs of toxicity (e.g., sustained nystagmus, slurred speech, and ataxia) are easy to observe. And finally, because phenobarbital intoxication usually does not produce disinhibition euphoria, the behavioral problems commonly associated with the short-acting barbiturates seldom occur.

The phenobarbital substitution technique can also be used with short-acting sedative-hypnotics other than barbiturates. Withdrawal from glutethimide using phenobarbital was reported by Vestal and Rumack (1974). Table 2 lists the equivalent of phenobarbital used to withdraw patients from the barbiturates and a variety of other sedative-hypnotics.

TABLE 2.—***Phenobarbital withdrawal equivalents for common sedative-hypnotics equal to 30 mg phenobarbital***[1]

Drug	Daily dosages equivalent to 30 mg phenobarbital in management of withdrawal
Amobarbital	100
Butabarbital	60
Pentobarbital	100
Secobarbital	100
Chloral hydrate	500
Ethchlorvynol (Placidyl)	350
Glutethimide (Doriden)	250
Meprobamate (Equanil, Miltown)	400
Methaqualone (Quaalude, Sopor, etc.)	300
Methyprylon (Noludar)	100
Chlordiazepoxide (Librium)	100
Clorazepate (Tranxene)	50
Diazepam (Valium)	50
Flurazepam (Dalmane)	30
Oxazepam (Serax)	100

[1] Withdrawal equivalence is not the same as therapeutic dose equivalency.

In using the phenobarbital substitution and withdrawal technique one may, if the patient is in acute withdrawal and in danger of having seizures, administer the initial dose of phenobarbital by injection. We recommend 200 mgs intramuscularly for stabilization. If nystagmus and other signs of intoxication develop following the intramuscular dosage, it is doubtful that the individual is barbiturate dependent. Based on the phenobarbital dosage calculated using the withdrawal equivalence, the patient is maintained on the oral dose schedule for 2 days and then withdrawn with a graded reduction not to exceed 30 mg per day. Regardless of the calculated dosage, doses of phenobarbital should not exceed 500 mg per day.

The dosage of phenobarbital is calculated by substituting one sedative dose (30 mg) of phenobarbital for each hypnotic dose (100 mg) of the short-acting barbiturate the patient reports using. For example, a daily dosage of 500 mg of amobarbital suggests that 5x30 mg of phenobarbital should be used initially in managing the withdrawal. In spite of the fact that

TABLE 3.–*Alcohol/phenobarbital withdrawal equivalents*

Average daily quantity of alcohol consumed for greater than 1 month	Equivalent
1 ounce (30 cc) of 80-proof alcohol	15 mg phenobarbital.
1 pint (480 cc) of 80-proof alcohol	240 mg phenobarbital.
1 fifth (4/5 quart) (760 cc) of 80-proof alcohol	380 mg phenobarbital.
1 quart (960 cc) of 80-proof alcohol	480 mg phenobarbital.

many addicts exaggerate the magnitude of their addiction, we have found the patient's history to be the best guide to initiating withdrawal. If the extent of the addiction has been grossly overstated, toxic symptoms will occur during the first day or so of treatment. This problem is easily managed by omitting one or more doses of phenobarbital and recalculating the daily dose.

If there is a mixed addiction such as alcohol-barbiturate dependence, the phenobarbital schedule must be modified to reflect the alcohol-sedative cross-tolerance (Wesson and Smith 1977). The phenobarbital equivalent is shown in table 3. The phenobarbital equivalence to the alcohol is added to the phenobarbital equivalence for the other sedative-hypnotic in determining the total initial daily dosage.

If heroin dependence exists, an opiate-specific detoxification schedule using methadone in combination with the phenobarbital schedule must be initiated. The phenobarbital is withdrawn first, followed by withdrawal of the methadone (Wesson and Smith 1977).

Detoxification from barbiturates and other sedative-hypnotic dependence should be instituted in the controlled environment of a hospital setting. Outpatient barbiturate detoxification has been reported (Gay et al. 1972) but should only be attempted by experienced staff with patients for whom hospitalization is not possible.

Knowledge about the treatment of individuals is still in its infancy and basic research into the biochemistry of sedative-hypnotic dependence is needed. The treatment of physical dependence on barbiturates at the clinical level is usually successful when the patient will cooperate, but postdetoxification treatment is still unsuccessful in many cases. Teaching drug abusers to cope with everyday anxieties without resorting to pharmacological oblivion, through such treatment modalities as biofeedback and acupuncture, shows promise; but these modalities need clinical research to ascertain their utility in sedative-hypnotic dependency.

Postdetoxification psychiatric evaluation is essential, as many barbiturate abusers have underlying psychopathology, particularly depression. The use of tricyclic antidepressants for this depression should be considered in conjunction with counseling. Some barbiturate abusers are candidates for long-term individual psychotherapy, whereas others are best managed through a group therapy process either in a residential or nonresidential setting. Because of the high numbers of barbiturate and other sedative-hypnotic prescriptions in the United States, physicians need to have improved training in this area to prevent iatrogenic sedative-hypnotic dependence and to improve treatment when such dependence occurs. Finally, education for the general public needs to be improved to facilitate awareness of the abuse potential of the sedative-hypnotic drug group.

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22. Cocaine

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Until recently scientific knowledge about cocaine use and abuse was very limited, and most of it was based on studies more than 50 years old. There were no controlled experiments on human beings; even the clinical literature was sparse and affected by the limitations and prejudices of an earlier era. Recently cocaine has been gaining popularity on the street faster than any other drug and, partly as a result, more significant work has been done on it in the last 5 years than in the preceding 40. This research is of several kinds: controlled experiments on human beings and animals; animal studies aimed at discovering theoretical models of psychosis; studies on medical uses, clinical reports on adverse effects and treatment; surveys and sociological reports on illicit use; chemical detection; and identification studies. There have been no surprising discoveries, but we have built our knowledge on a sounder basis and filled gaps in it. Since illicit use has become so widespread, it is easier to judge the effects and dangers of cocaine as it is ordinarily used, avoiding the bias and sensationalism that often accompany insufficient information. Our emphasis will be on work done in the last 5 years even when the results are a confirmation or summary of earlier work.

ACUTE EFFECTS

The central stimulant and sympathomimetic effects of cocaine are familiar: euphoria, confidence, energy, increased heart rate and blood pressure, dilated pupils, constriction of peripheral blood vessels, and rise in body temperature and metabolic rate. They have recently been classified, with detailed references, in a useful paper (Byck and Van Dyke 1977). An excellent summary of behavioral effects on animals is also available (Woods 1977).

A recent study (Fischman et al. 1976) examines the cardiovascular and subjective effects of intravenous cocaine injection in nine subjects. Cocaine, dextroamphetamine, and placebo were administered in a controlled, double-blind experiment. The effects of cocaine on heart rate, blood pressure, respiratory rate, and mood increased as the dose was raised from 4 mg to 32 mg. Major effects were experienced only at doses of 16 mg and above; subjects rated doses of 24 mg and 32 mg as among the highest they had ever taken. Dextroamphetamine (10 mg) was equivalent to 8 mg to 16 mg of cocaine, and subjects usually had trouble distinguishing between the two drugs, although the effects of dextroamphetamine were sometimes perceived as lasting longer. The authors conclude that the stimulant action of cocaine resembles that of amphetamine.

In another controlled study, intranasal (snorting) and intravenous routes were compared. Nineteen cocaine users took doses of 10 mg and 25 mg intranasally and intravenously, and 100 mg intranasally. The 10 mg intranasal dose had no observable subjective or physiological effect; at 25 mg there was a rise in systolic blood pressure (no other physiological effects) and some euphoria (the most commonly reported feeling was relaxation). One hundred mg affected mood strongly and also raised heart rate and diastolic blood pressure but not respiratory rate or body temperature. Intravenous cocaine had marked physiological and mood effects even at the 10 mg dose. In its effect on blood pressure, 25 mg of intravenous cocaine was equivalent to 20 mg of oral dextroamphetamine in another study. Twenty to thirty minutes after the 25 mg intravenous dose and 45 to 60 minutes after the 100 mg intranasal dose, a few subjects suffered a mild letdown during which they experienced lethargy, irritability, and a desire for more cocaine (Resnick et al. 1977). The average street dose of cocaine, it is worth noting, is 20 mg to 50 mg intranasally.

A report on the effects of intravenous cocaine in rhesus monkeys at doses of 0.05 mg to 5 mg per kg indicates increases in respiratory rate, body temperature, and heart rate only at the largest dose, while increases in pupil size and changes in motor activity and other behavior begin at 0.2 mg per kg. Changes in behavior were more clearly correlated with dose than physiological changes, and they occurred at much lower doses; for example, monkeys would press levers for a dose as low as 0.05 mg per kg (Wilson et al. 1976).

Cocaine has been administered to depressed patients orally and intravenously (Post, Kotin et al. 1974; Post, Gillin et al. 1974). Oral cocaine produced no consistent changes in mood and behavior up to a dose of 200 mg, although it reduced sleep time. Intravenous cocaine at doses of 2.5 mg to 25 mg produced marked physiological and mood effects: Heart and respiratory rates and blood pressure rose, and patients experienced a tearful emotional catharsis.

In another study cocaine was administered to normal subjects in 10 percent solution intranasally at doses of 0.19 mg to 1.5 mg per kg. There was no consistent cardiovascular effect, and the peak blood concentration came about 60 minutes after application, much later than the high point of euphoria reported in street use of cocaine (Byck et al. 1977).

Research done within the last 5 years has put us in a better position to estimate the kinds and magnitude of adverse reactions. Studies of recreational users suggest that for the great majority, undesired effects are rare and not serious (Siegel 1977; Waldorf et al. 1977). But some authorities familiar with the street scene insist that both laboratory experiments and surveys tend to underestimate their number and severity (Wesson and Smith 1977). The most common undesirable effect is a feeling of irritability and lassitude after the euphoria subsides, with a desire for more of the drug. Physicians in attendance at rock music concerts and elsewhere have reported an acute anxiety reaction with symptoms including high blood pressure, racing heart, anxiety, and paranoia (Rappolt et al. 1976). More severe effects like tactile and other hallucinations and delusions are uncommon but do occur. Hospitals rarely see cases of cocaine psychosis, but a few have been reported, mainly in habitual cocaine abusers (Wesson and Smith 1977); it is qualitatively similar to amphetamine psychosis but lasts a shorter time, and for that reason, among others, rarely comes to the attention of physicians.

In high doses cocaine can cause depression of the medullary centers and death from cardiac or, more often, respiratory arrest. Severe physical poisoning and death from the toxic effects are rare. There are no well-documented anaphylactic (allergic) reactions (Van Dyke and Byck 1977). Six cases of death from cocaine poisoning in 1970-1973 are recorded in a 1974 paper (Price 1974). In every case the cocaine was apparently either injected intravenously or eaten in large quantities. Another study of cocaine-related death (Lundberg et al. 1977) finds five documented cases and adds nine more, three of which involved cocaine alone, always taken intravenously; in the other cases alcohol, morphine, or other drugs were also involved. In a 3-year survey of Dallas County, Texas, (Lundberg et al. 1977) the authors found only 2 cases of a total of at least 228 deaths caused by drugs in which cocaine was present at all.

A recent study uses data from coroners' and medical examiners' offices over an area with a population of 63 million (Finkle and McCloskey 1977). From 1971 to 1976, 111 reported fatalities involved cocaine. (An increase from 2 deaths reported as associated with cocaine in 1971, to 29 deaths reported in the first 6 months of 1976 suggests both more cocaine use and more awareness of cocaine on the part of coroners and medical examiners.) Of the 111, 25 were not toxic overdoses but deaths by murder, suicide, or accident related to drug use. Only 26 of the 111 cases involved cocaine alone. Of the 26 deaths associated with cocaine alone, 4 (15.4 percent) were from oral cocaine ingestion, either suicides or smuggling incidents; 2 (7.7 percent) were from intranasal use; the rest were from intravenous injection, or the method of administration was unknown. Six of the twenty-six were suicides. Most of the deaths were from respiratory arrest preceded by seizures. Deaths from opiates and cocaine in combination were more common than deaths from cocaine alone. From May 1975 to April 1976 medical examiners reported to the Federal Drug Abuse Warning Network (DAWN) 57 cocaine-related deaths, including 6 (out of 4,668 drug-related deaths) that involved cocaine alone (Petersen 1977).

For acute cocaine overdose, the recommended treatment is administration of oxygen (under pressure if necessary) with the patient's head down in the Trendelenburg position, muscle relaxants if required to accomplish this, and, if there are convulsions, intravenous short-acting barbiturates (e.g., 25 mg to 50 mg pentobarbital sodium (Gay and Inaba 1976). For the anxiety reaction with hypertension and tachycardia, a dose of 10 mg to 30 mg of intravenous or intramuscular diazepam has been recommended.

An alternative that seems to be a specific antagonist of cocaine's sympathomimetic effects is propranolol (Inderal), a blocker of peripheral adrenergic receptors. Fifty cases have been successfully treated with one mg of propranolol injected intravenously every minute for up to 8 minutes (Rappolt et al. 1976, 1977).*

Because cocaine increases energy and confidence and can produce irritability and paranoia, it has often been said to cause physical aggression and crime. Although it clearly can do so in some circumstances (Grinspoon and Bakalar 1976, p. 225), there is no evidence of any consistent association. The effects on aggressive behavior have been studied in mice, monkeys, and pigeons (Hutchinson et al. 1976, 1977). Like caffeine and nicotine, cocaine increases nonattack behavior produced by a noxious stimulus more than it increases attack behavior; in contrast, dextroamphetamine causes a relative increase in attack responses. What little evidence there is suggests that cocaine is not as conducive to aggression as other drugs like alcohol, barbiturates, and amphetamines.

CHRONIC EFFECTS

The chronic effects of cocaine have recently been summarized with detailed references (Byck and Van Dyke 1977). It is important not to attribute to ordinary recreational use the kinds of pathological effects observed in high-dose, intravenous injection of laboratory animals. If it is used no more than two or three times a week, cocaine creates no serious problems (Siegel 1977). Taken daily in fairly large amounts, it can disrupt eating and sleeping habits, produce minor psychological disturbances including irritability and difficulty in concentration, and create a serious psychological dependence (Waldorf et al. 1977; Siegel 1977). Cocaine does not produce physical dependence in the sense that alcohol or heroin does, but sometimes mild withdrawal symptoms like anxiety and depression arise. Perceptual disturbances (especially pseudohallucinations), paranoid thinking, and, rarely, psychoses also occur in chronic users (Wesson and Smith 1977; Siegel 1977). A runny or clogged nose is common and can be treated with nasal decongestant sprays. Less often, the nose may become inflamed, swollen, or ulcerated; in the older literature there are reports of perforated septa, but they are rarely found today. All the undesirable effects are much more commonly produced by intravenous injection.

In experiments where unlimited access to intravenous cocaine is provided, animals will kill themselves by voluntary injections. In one recent experiment, for example, monkeys to whom intravenous cocaine was available 23 hours a day (infusion of 0.2 mg per kg per injection) developed hyperactivity, tactile hallucinations, ataxia, severe weight loss, tremors, and convulsions as they continued to inject the drug; they died within 5 days. Methamphetamine and dextroamphetamine had similar effects (Johanson et al. 1976).

Although human beings usually do not use cocaine in this way, craving can become a serious problem for those who have constant access to it. Users sometimes find it necessary to deny themselves access to cocaine for a few days or weeks (Waldorf et al. 1977); some have been known to try to lock up their bank accounts so that they will not spend all their money on it (Resnick and Schuyten-Resnick 1976). Because of this potential for psychological dependence and the accompanying problems, people familiar with cocaine are aware of a need for caution in using it.

Dependence potential varies with route of administration. For example, animal experiments continue to show that intravenous cocaine is one of the most powerful, possibly the most powerful of drug reinforcers (Woods 1977; Goldberg and Kelleher 1977; Johanson and Schuster 1975). Monkeys will also smoke a cocaine cigarette and chew cocaine-based gum; they prefer a cocaine cigarette to a lettuce cigarette, but they do not choose cocaine gum over procaine or ordinary sugar gum (Siegel et al. 1976).

Other issues explored in recent research are tolerance and sensitization. Recent experience has confirmed that at the usual recreational doses, tolerance to the euphoric effect does not arise. One study on monkeys found progressive tolerance to the convulsive effect of daily high intravenous doses (starting at 3.1 mg per kg), which disappeared after 40 days when the drug was discontinued. Tolerance also developed for cardiac and respiratory stimulant effects in this experiment (Matsuzaki 1976). However, other studies have found that chronic treatment lowers rather than raises the convulsive threshold in rats (Stripling and Ellinwood 1977). More undisputed are the phenomena of reverse tolerance or sensitization observed in animal experiments. Rats show increasing hyperactivity and stereotyped movements for an hour or two after each of a series of daily injections of the same dose (Post and Rose 1976; Stripling and Ellinwood 1976, Kilbey and Ellinwood 1977a). This increased sensitivity endures for as much as 7 weeks after the drug is discontinued (Kilbey and Ellinwood 1977b). Several theories have been developed to account for the sensitization effect (Stripling and Ellinwood 1977), which is also produced by amphetamines. It may partly account for the fact that stimulant psychoses occur mainly in chronic abusers who take a higher dose than usual for a short time.

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*A warning should be added. In a recent letter to the New England Journal of Medicine (December 1, 1977), John D. Catravas and several colleagues at the University of Mississippi describe a controlled experiment in which they gave dogs intravenous propranolol (6 mg to 10 mg per kg) and an hour later a fatal dose of cocaine. The propranolol did not prevent or retard death, although pretreatment with chlorpromazine did. The authors warn that propranolol is effective at best only against moderate overdose and should not be regarded as a protection against lethal doses.

At present chronic cocaine abuse does not commonly appear as a medical problem, and there is little literature on treatment. For chronic cocaine abusers who appear at clinics in a state of anxiety, diazepam or chloral hydrate has been recommended. For long-term treatment the only recommendations are very general—counselling or psychotherapy (Gay and Inaba 1976).

Animal experiments and some human cases show that cocaine has a real potential for abuse, but at the present level of use it does not present many serious social or medical problems. For example, according to the records of DAWN from May 1975 to April 1976, cocaine alone or in combination with other drugs was involved in only 3.6 percent of cases at drug crisis intervention centers and less than 1 percent of drug cases in hospital emergency rooms (Petersen 1977). The Client Oriented Data Acquisition Process (CODAP) reports that 1.2 percent of clients appearing at federally funded drug treatment facilities in 1975-1976 (about 650 clients in all) gave cocaine as their primary drug of abuse; another 4 percent reported cocaine as a secondary drug problem (Siguel 1977). It is hard to say what the reality behind these statistics is, since they say nothing about the nature or real causes of the problems faced by cocaine users. Some authorities contend that there is much hidden cocaine abuse, especially in combination with depressants like barbiturates, heroin, and alcohol (Wesson and Smith 1977), some of which has serious consequences that do not come to the attention of any treatment system. In general, cocaine seems to present some of the same dangers as amphetamines but in a less severe form. Most cocaine users have learned ways of taking the drug that prevent adverse effects. Whether the present high price and limited accessibility are also crucial in forestalling abuse remains to be seen.

MEDICAL USES

The only recognized medical use for cocaine in this country is as a topical anesthetic in eye, ear, nose, and throat surgery and in endoscopy of the upper respiratory and digestive tracts. This use has recently been defended as safe, effective, and necessary in the face of suggestions that it should be stopped because adequate substitutes are available (Schenck 1975). Cocaine combines vasoconstriction (especially important in nasal surgery), long duration of anesthesia (an hour), and relatively low toxicity in a way no synthetic topical anesthetic can duplicate. The usual maximum dose is 200 mg. The practice of using epinephrine along with cocaine to retard its absorption by the mucous membranes has been rejected as unnecessary and dangerous (Anderton and Nassar 1975). A questionnaire was recently sent to 1500 plastic surgeons; of 741 who answered, 592 used cocaine in nasal surgery. They reported no deaths and 14 severe reactions in 93,004 cases. Ninety-five had never used cocaine, and 54 had stopped using it; the latter had seen 5 deaths and 20 severe reactions in 15,028 cases (Freehan and Marcusi-Ungaro 1976).

Cocaine is also used in Great Britain and Canada, but not in the United States, as an ingredient in Brompton's mixture, a preparation for treating the chronic pain of terminal cancer. The drink contains 10 mg of cocaine, 5 mg to 20 mg of morphine, and 2.5 ml of alcohol in a 20 ml solution with sugar syrup (Mount et al. 1976, Melzack et al. 1976). The cocaine probably serves to prevent too much sedation and clouding of the senses while enhancing pain relief. In the United States a similar use has recently been found for amphetamines in combination with morphine (Forrest et al. 1977).

Recently, stimulants have been used in medical research on model psychoses (Ellinwood 1974; Grinspoon and Bakalar 1976, pp. 167-175). Cocaine and amphetamines mimic functional psychoses more closely than any other drugs. The sensitization of animals to certain effects of cocaine after chronic treatment and the progressive changes in their behavior may correspond to the development of a functional psychosis in human beings under chronic stress. Analogous to lowering the threshold for convulsions by repeated electrical stimulation of the limbic system, it has been proposed that cocaine produces a kind of pharmacological kindling of the mechanisms that cause hyperactivity and stereotyped movements in animals, and, presumably, psychosis in human beings (Post et al. 1976, Post 1977). The effect probably involves the neurotransmitter dopamine; the peculiar pharmacological properties of cocaine as opposed to amphetamines (Groppetti and di Giulio 1976, Scheel-Krüger et al. 1977) may prove relevant in this research.

DETECTION AND IDENTIFICATION

Because of greatly increased medical and legal requirements, much work has been done on detection and identification in the last few years. For identification of street samples, methods used include the cobalt thiocyanate test (Winick and Eastly 1975), a test based on the odor of methyl benzoate (Grant et al. 1975), thin-layer chromatography (Winick and Eastly 1975), high pressure liquid chromatography (Trinler and Reuland 1975), and gas-liquid chromatography (Hammer et al. 1974). Tests for cocaine and its metabolites in blood plasma and urine include gas-liquid chromatography (Javaid et al. 1975), which is slow and expensive but sensitive; thin-layer chromatography (Wallace et al. 1975), which is rapid and cheap but less sensitive; EMIT or enzyme multiplied immunoassay technique (Jatlow 1976), mass spectrometry, and others. The various identification methods have recently been summarized in several papers (Bastos and Hoffman 1976, Jatlow 1976) and their relative merits estimated (Hawks 1977).

RESEARCH IMPLICATIONS

An important area for further research is the study of model psychoses and their relation to the effect of cocaine on neurotransmitters. For this purpose studies on the modification of cocaine effects by other centrally acting drugs are necessary, as well as comparisons between the pharmacology of cocaine and that of amphetamines and tricyclic antidepressants. Differences and similarities between the acute effects of cocaine and amphetamines must also be explored further, and the behavior changes produced in animals by chronic stimulant use must be defined more carefully.

Other research topics are also of interest. One is the exploration of structural variations on the cocaine molecule for medical purposes. It will also be useful to clarify ideas about drug abuse and drug dependence by further animal experiments comparing cocaine with other drug and nondrug reinforcers. Since abuse potential seems to depend greatly on route of administration, more experimental work is needed on the effects of intranasal and oral as opposed to intravenous cocaine. Finally, more detailed clinical and demographic studies of chronic cocaine abusers who come to treatment centers would throw light on a subject about which very little is known and improve our capacity for treatment and prevention.

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23. The Enigma of PCP

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Among all of the varied patterns of drug use and abuse that collectively define the contemporary drug scene, it is unlikely that any phenomenon can be considered so strange as the emergence of PCP—phencyclidine—as a widespread drug of choice. PCP is an enigma! Neither the drug itself nor its apparently growing popularity in the drug culture can be understood easily in terms of the paradigms of conventional science or drug lore:

- The pharmacology and clinical syndrome of PCP are atypical; PCP cannot be classified easily among other psychotropic drugs.
- The subjective effects of PCP are highly varied; users do not describe the PCP "high" as being similar to that of other drugs.
- The reported pleasures and benefits of PCP use are few, and even confirmed users agree that it is a risky drug. Motives for the use of PCP are more obscure than those for using other drugs.
- Patterns of PCP use and its recent spread to communities throughout the United States do not appear to correspond to what is known about the use and spread of other drugs.

In the present context of growing fears about the potential dangers of PCP, there exists a pressing need for information upon which sane and realistic intervention, treatment, and control strategies can be based. Yet in almost all regards, questions about PCP far outnumber answers available through empirical evidence. Much of the extant literature bears tenuously, if at all, on critical issues of policy, and a substantial majority of the most important questions that might be asked about PCP have yet to be addressed systematically.

AN HISTORICAL OVERVIEW

To provide a background for discussions of needed research, let us begin with a brief review of the history of PCP. For though it spans a period of little more than 20 years, the history of PCP may be divided into four distinct periods, each of which reveals a different facet of its unique character.

The Promise of PCP (Mid-1950s to 1957)

While the synthesis of PCP [phencyclidine, 1-(1-phenylcyclohexyl)-piperidine HCL] was first described in 1926 (Shulgin and MacLean 1976), for all practical purposes its history began in the mid-1950s when scientists at Parke, Davis & Company initiated studies of its potential use as an anesthetic drug.[1] In effect, preliminary findings of pharmacological, toxicological, and metabolic studies conducted during this period suggested that PCP was the prototype of a unique class of drugs having a "dissociative anesthetic" effect—i.e., the ability to produce anesthesia without "significant cardiovascular and respiratory depression" (Corssen and Domino 1966).

While PCP did not induce sleep per se, it produced sufficient analgesic effect to permit abdominal surgery on monkeys who remained unbothered though apparently awake. Coupled with other evidence of its relatively low toxicity and high analgesic potency, PCP showed promise of filling a long-standing need for an intravenously administered, short-acting analgesic of the "dissociative" type (Chen et al. 1959; Greifenstein et al. 1958), and on the basis of that evidence it was approved by FDA in 1957 for clinical testing on human subjects.

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[1] We have been unable to determine an exact date for the discovery of PCP's psychoactive effects. Secondary sources refer to its development as an anesthetic beginning in the mid- to late 1950s. An earlier date seems more likely as considerable work preceded its approval by the Food and Drug Administration (FDA) for use with human subjects in 1957.

The Promise Unfulfilled (1957 to 1965)

From the earliest report of its use with human subjects (Greifenstein et al. 1958), problems associated with the clinical use of PCP cast extreme doubts about its potential use in anesthesiology (Domino 1964). Previously unanticipated and untoward psychological effects ranging from mild to profound disorientation, agitation, manic excitation, delirium, and hallucinations were manifested frequently by postoperative patients as they emerged from PCP-induced anesthesia. While PCP proved to be generally satisfactory as a surgical anesthetic, the regular occurrence of adverse psychological and "stormy behavioral" side effects more than offset the benefits of reduced cardiovascular and respiratory depression.

Throughout the remainder of this period—until 1965 when Parke, Davis & Company requested that use of PCP with human subjects be discontinued—some research continued on its use in surgical anesthesia, preoperative and postoperative analgesia, and for control of intractable pain (cf. Domino 1964). However, most attention shifted away from its anesthetic properties to focus specifically on its psychoactive effects.

Thus, for example, PCP administered intravenously in subanesthetic doses was found to induce schizophrenic-like symptoms in normal subjects and to intensify the primary symptoms of schizophrenic patients (Luby et al. 1959). More so even than LSD-25, PCP was found to alter perceptual, cognitive, and motor behavior of normals to mimic schizophrenia (Cohen et al. 1962; Rosenbaum et al. 1959). Numerous studies conducted during this period focused, therefore, on the psychotomimetic properties of PCP (i.e., its ability to produce "model" psychoses in normal subjects) and on its therapeutic potential in the treatment of schizophrenia and other psychiatric disorders (e.g., Davies 1961; Itil et al. 1967).

Finally, observations of similarity between clinical syndromes induced by PCP and those resulting from prolonged sensory deprivation (Cohen et al. 1962; Luby et al. 1959; Meyer et al. 1959) led to interesting theoretical speculations that both schizophrenic and PCP effects result from impairments in sensory—particularly, proprioceptive—input processes.

By 1965, interest in PCP had largely died, along with a general interest in the study of model psychoses (cf. Hollister 1968). And for almost a decade PCP was more or less ignored while an emerging youth drug culture caused attention to be focused on a series of other drugs.

PCP: The Great Pretender (1965 To 1973)

According to many sources (Burns and Lerner 1976; Emergency Medicine 1976; Graeven 1977; National Clearinghouse for Drug Abuse Information 1973; PharmChem 1972, 1975; Reed and Kane 1972; STASH 1975), PCP appeared briefly on the illicit drug market in Los Angeles in 1965 but did not attract any considerable attention until it emerged as the "PeaCe Pill"[2] during the 1967 "summer of love" in San Francisco's Haight-Ashbury hippie community and in the summer of 1968, as "hog," in New York's East Village hippie enclave (cf., Lindgren et al. 1969).

Although it was touted as more potent than marihuana though less disorienting than LSD—the avowed favorites of the hippies at that time—contemporary reports indicate that users reported primarily unpleasant experiences with PCP and the drug virtually disappeared from both the San Francisco and New York marketplaces within months. Data on the prevalence or extent of PCP use in the time of its introduction are not available, but approximately 25 percent of a representative sample of Haight-Ashbury hippies studied in 1968-1969 reported having used it at least once (Pittel 1973).

Beginning presumably in 1969 (though probably earlier as well) and continuing at least until 1973, the sale of PCP on the illicit marketplace appears to have been primarily deceptive; either PCP was sold under the guise of some more desirable drug, notably mescaline, psilocybin, or THC (tetrahydrocannabinol), or it was used as an adulterant in combination with other drugs, particularly LSD and other hallucinogens (Cheek et al. 1970; PharChem 1972, 1975; Reed and Kane 1972). Even in the light of later evidence which suggests a diminishing incidence of PCP as a drug of deception in recent years (Keally and Webber 1975; Lundberg et al. 1976; PharmChem 1976), 75 to 90 percent of street drug samples found to contain PCP are still purported to be some other drug.

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[2] Meyers, Rose, and Smith (1967/1968) presume that the name "PeaCe Pill" was derived from the abbreviation, PCP, taken from the full chemical name of phencyclidine. Since that time PCP has appeared "on the streets" under a multitude of names—perhaps more than any other illicit drug—including: angel dust, cadillac, crystal, crystal joints, crystal weed, cyclones, dust, elephant tranquilizers, goon, hog, horse tranks, KJ, mist, ozone, peace weed, rocket fuel, scuffle, snorts, supergrass, superweed, and surfer. During the time of its manufacture by Parke, Davis & Company, it was known as Sernyl. It is now manufactured as a veterinary anesthetic by BioCeutic Laboratories, Inc., under the trade name Sernylan.

The Menace of PCP

Based largely on increases in adverse medical and psychiatric effects attributed to PCP since 1973, and on its spread throughout the United States from a few locales of concentrated use (e.g., Burns and Lerner,[3] Graeven 1977), PCP is fast gaining notoriety as the drug menace of the late 1970s.

Among drugs responsible for medical emergencies or deaths—as reported by programs participating in the DAWN data collection effort—PCP has increased from 23rd ranked in 1973 to 16th ranked in 1975 and 1976. Among youth from 12 to 18 years of age, PCP currently ranks seventh nationwide in crisis center reports, but it is no longer among the top 20 ranked drugs in either medical examiner or emergency room data compiled for the most recent DAWN V report.

Cases of PCP poisoning have been reported with increasing frequency in the medical literature (Eastman and Cohen 1975; Liden et al. 1973, 1975; Tong et al. 1975) and a score of deaths have been attributed to both its pharmacological (Burns and Lerner 1976b; Eastman and Cohen 1975; Kessler et al. 1974; Liden et al. 1973) and behavioral effects, i.e., deaths from drowning, fire, falls, and automobile accidents (Burns and Lerner 1976b). Users are reported to exhibit bizarre, unpredictable, and aggressive behavior, combined with a severely confused and agitated state of mind while acutely intoxicated (Fauman et al. 1976; Luisada and Brown 1976; Stein 1973). Some users also experience a prolonged recovery period characterized by psychotic-like symptoms, particularly after high dose oral ingestions (Luisada and Brown 1976; Rainey and Crowder 1975). Chronic PCP users report experiencing continuing problems with perception, speech, memory, and cognitive processes even during a period of drug abstinence, as well as psychological dependence and tolerance to behavioral effects (Burns and Lerner 1976b). Due in part to the unusually great variability among street samples of PCP, relatively little is known about its dose-response relationships. Low doses apparently give rise either to euphoria and disinhibition or to perceptual distortion, irritability, and paranoia. As dosage increases, sedation, catalepsy, and convulsions may occur, and in high doses PCP is known to be toxic, though what constitutes a toxic dose will vary both with route of administration and individual factors (National Clearinghouse for Drug Abuse Information 1978).

Yet, as the evidence of adverse and dire consequences mounts, so, too do speculations that PCP is becoming a drug of choice; that at least some users are no longer victims of deception, but are voluntary seekers of PCP (e.g., Burns and Lerner 1976a).

In sum, the history of PCP seems as enigmatic as the drug itself. From research with animals we learned that PCP was highly potent but relatively nontoxic even when administered intravenously. Based on work with medical patients and volunteers, we learned that PCP was a uniquely potent psychotomimetic drug, even in low doses, and that it has been given to thousands who became neither violent nor seriously disturbed, and who suffered no immediate or long-term harm. Reports from the hippie era suggested that accustomed users of other psychotropic drugs so eschewed the effects of PCP that they had to be tricked into using it. Finally, we now learn that the use of PCP is spreading and that it may become a drug of choice, although its effects are even more profound and potentially harmful than was ever suspected or observed heretofore.

With cumulative emphasis, the history of PCP makes it painfully obvious that research findings cannot be generalized easily across different subject populations or from one to another context of drug use. At the very least, the history of PCP demonstrates that we have much to learn about this drug before a final verdict can be made.

NEEDED RESEARCH ON PCP

Setting aside issues of primarily academic or theoretical interest, and those germane to the clinical management of adverse effects,[4] there remain a number of areas in which our knowledge of PCP is most sorely lacking. Let us consider the two most critical of these in relation to matters of public policy.

The Epidemic Threat of PCP

To ensure that policies regarding PCP are responsive to the nature of the threat it represents, high priority must be given to research designed to assess the actual extent of current PCP use and the dynamics of its recent spread. Data bearing on the apparently increasing incidence of PCP use nationwide provide no more than a sketchy outline of a problem that requires in-depth analysis.

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[3] R. S. Burns and S. E. Lerner 1977, personal communication.

[4] Our decision to limit discussion to research other than the most "pure" and the most directly "practical" is based on the assumption that pursuit of the former does not yield payoff to matters of public policy, except serendipitously, while support for the latter needs no justification except on humane grounds.

In effect, assumptions about the growing popularity of PCP as a drug of choice have been based largely upon evidence that documents: (1) increasing and more widespread incidence of medical and psychiatric problems attributed to its use; (2) increasing and more widespread reports of PCP seizures and PCP-related arrests by law enforcement agencies; and (3) more widespread appearance of PCP among samples of drugs submitted to "street drug" analysis programs. Impressive as these data may be as a justification for concern, they do not necessarily reflect either increased incidence or widespread prevalence of PCP use. And while such data suggest the possibility that PCP is becoming a drug of choice, they certainly do not confirm that this is the case. Only through carefully designed incidence and prevalence studies will it be possible to rule out the influence of improved diagnostic and/or reporting procedures on estimates of PCP use, and only through systematic research on users will we be able to learn whether they are using PCP knowingly.

In addition to the need for straightforward studies designed to assess the extent of current use of PCP, other research efforts might be directed profitably toward exploring the determinants of its apparent spread. To what extent, for example, might the spread of PCP be affected by availability of chemicals used in its manufacture or by changing patterns of availability and costs of other drugs on the illicit drug market? Similarly, we need to know more about the characteristics of communities in which PCP has and has not appeared, and to what extent focusing of public attention on PCP will encourage rather than deter its use (cf. Brecher 1972; Musto 1973).

Use and Users of PCP

While it is axiomatic that the effects of psychoactive drugs vary widely as a function of the psychological makeup of their users and the setting in which their use occurs, virtually nothing describing the psychosocial context of illicit PCP use can be found in the published literature. Except for a few preliminary reports (e.g., Graeven 1977; Pittel and Feldman 1977), this domain of great substantive concern has been ignored in previous research.

Because field studies of drug use and users yield valuable information that cannot be obtained through any other means, it is imperative that subsequent research efforts focus here rather than on the accumulation of additional pharmacological and toxicological data that may or may not bear on existing patterns of PCP abuse. Not only will such research provide a perspective that does not exist in the PCP literature, there is good reason to suspect that research on street use and users will resolve at least some of the apparent contradictions and paradoxes in our current knowledge of PCP.

By focusing on characteristics of PCP users, for example, research can disclose those differences in backgrounds, attitudes, values, and motives for drug use which differentiate users today from members of the hippie community who rejected PCP when it first appeared as an illicit drug a decade ago. Both direct evidence that PCP users also use a variety of other psychotropic drugs (National Institute on Drug Abuse 1978) and speculations that they were first attracted to the use of sedatives and/or stimulants (Pittel and Feldman 1977) suggest that PCP users are quite unlike the hippies who preferred mind-altering drugs like LSD and marihuana and who largely rejected primarily mood-altering drugs. By directing attention toward PCP users, rather than toward the drug itself, research may uncover a basis for understanding factors that contribute to the use of PCP today, while at the same time resolving the apparent paradox of a once-rejected drug emerging as a drug of choice.

Along the same lines, research on street use and users may yield answers to a number of pressing questions about motives underlying the use of PCP. One promising line of research, for example, might seek to answer questions about the status of PCP users among their peers. Are PCP users "losers" who are unable to make the grade among heroin addicts or users of other "status" drugs? Do they use PCP with full knowledge of its potential hazards as a daring act of courage designed to establish their reputation on the streets, or as a gesture of defeat, a form of subintentioned suicide motivated by a lack of hope? Is the spread of PCP likely to continue because its users are held in great esteem, or is it a fad whose spread is limited because its users are looked down upon by their peers?

Subsequent research might focus also on more psychological questions that bear directly on matters of praxis and policy. Are PCP users, for example, more prone to violence than users of other drugs, or does the drug itself trigger their hostility? Do PCP users suffer characteristically from impaired judgment or other ego deficits which exacerbate the behavioral toxicity of the drug? Are the subjective effects of PCP truly more ineffable than those produced by other drugs, or does PCP merely seem to be unique in this regard because its users tend to be less verbal and articulate? And perhaps the most important question of them all, what altered state of consciousness or enhancement of other capacities do PCP users seek, and what therapeutic means might help them to achieve their desires in some other way?

At some level, PCP users must enjoy the subjective effects of the drug or they must achieve other needed gratifications through its use. Without research focused on the users and the use of PCP we cannot hope to resolve what can now be seen as a puzzle: the continued use of PCP by users who appear to be aware of its risks, and who do not claim to enjoy or benefit from its effects. There is, of course, no guarantee that this research approach or any other will yield meaningful results. But it is certain that a majority of the most critical questions about PCP cannot be answered at all if research on street use and users continues to be ignored.

PCP IN PERSPECTIVE

PCP is not the first drug upon which public attention has focused, and it will not be the last. It is merely the most recent entry to a perhaps infinite list of psychoactive drugs with a potential for abuse. Nor is it clear that PCP will be ultimately more enigmatic than any drug at a comparable stage in its development. Like most other entries to the field, PCP is an interesting drug with some unique properties. PCP has been hailed as both noble and ignoble to an extreme degree, and the latter claim will probably prove as false as the former when all the results are in. Most if not all of the apparent contradictions and paradoxes in the current literature are sure to yield to new research evidence.

Because we have emphasized strategic research bearing on matters of public policy rather than specifying questions tied to the existing lore and literature on PCP, it should be clear that our recommendations for research apply equally to any other drug with a potential for abuse. By focusing on generic issues we have missed the opportunity to spell out a host of intriguing hypotheses about PCP, and we have let a myriad of questions go begging. All of these hypotheses and questions are important, but we believe that it is more important to make the point that they may all be subsumed under domains of research that are essential to the understanding of and response to any drug. It is far more important to develop generic research strategies that will provide a basis for comparative analysis than to focus on each new drug as a unique challenge requiring a unique research approach.

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drug problems in specific populations

This section is less directly related to drugs and to drug treatment than previous sections, but contains information that will be useful to treatment personnel. It is concerned with patterns of drug use and correlates of use. Two chapters deal with the opposite ends of the life cycle, Blum and Richards on youthful drug users, who have been widely studied, and Eisdorfer and Basen on drug misuse among the elderly, which only recently has begun to receive the attention it needs.

Woody and Blaine's chapter on depression in narcotic addicts does not fit the heading of this section too well, but seemed to fit here better than elsewhere. The problem they address is one that concerns therapists in all treatment modalities. Nyberg's chapter on rural drug abuse and rural drug programs is brief, because little attention has been paid to this area until very recently, and data are sparse. But as he points out, this is another area where there is a pressing need to find ways of modifying current treatment methods, organizational structures, and possibly funding mechanisms to fit situations different from those for which they were originally devised.

As many of the chapters of this handbook point out, the drug problem is largely a problem of minority groups, and a chapter on drug use among minorities could legitimately include almost all aspects of the problem. Faced with the impossibility of covering this within the limits of a short chapter, Espada has chosen to focus on one point, the need he perceives for minority group representation at the policymaking level.

24. Youthful Drug Use

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Almost all known cultures have used psychoactive drugs to facilitate social intercourse, to alter consciousness, to heal. Our society's expanded chemical manipulations simply represent a larger technical capacity, more wealth, leisure, individual choice and, conversely, a reduction in constraining social settings, peer and family standards, and personal proscriptions as to what is not done. These conditions assure considerable variety in the drug behavior and associated outcomes in about 45 million Americans between 10 and 21, the population of interest here. Because ours is also a time of rapid change, being young is difficult. School failure, children's suicide, accidents, venereal disease, running away, and delinquency up to now have been increasing (MacLeod 1976). Youthful drug use, like the foregoing phenomena, may be understood as having stress as well as opportunity as part of its underpinnings. Some of that drug use will be problematic; most will be significant to the youngster. Families and communities will be attentive to those excerpts from youthful drug conduct which are visible, unconventional, symbolically threatening, or which do in fact prove either an acute hazard, impede normal development, or forecast a declining career. Since there is a direct relationship between the risk of these disturbing features and outcomes and the degree to which drug use is unsupervised, that is, not integrated into approved familial and culture settings as at the family dining table, or in the doctor's office, there is public concern with the extent of unsupervised use.

OVERVIEW

Prevalence

Drug use surveys provide data on the actual extent of use. The most recent comprehensive national one, sponsored by the National Institute on Drug Abuse (NIDA) (Abelson et al. 1977), shows that among youth age 12 to 17, over 28 percent have tried marihuana, 9 percent inhalants (sniffing glue, gasoline, and the like), 5 percent hallucinogens, 4 percent cocaine, 1 percent heroin. Among medically available substances used without medical advice, 6 percent have used other opiates (cough syrups or pain killers), 5 percent stimulants, 4 percent tranquilizers, and 3 percent sedatives. (The comparable figures for alcohol are 53 percent and tobacco 47 percent.) For youths and young adults aged 18 to 25, one finds that 60 percent have used marihuana, 20 percent hallucinogens, 19 percent cocaine, 11 percent inhalants, and almost 4 percent heroin. Among medically available drugs, over 21 percent of this age group have used stimulants nonmedically, 14 percent other opiates, 18 percent sedatives, and over 13 percent tranquilizers. No more than a few percent at any age report current experience with any illicit drug or drug class, with the exception of cannabis (marihuana or hashish); about 16 percent of the 12- to 17-year-olds and almost 28 percent of the 18 to 25 group affirm using it within the last month. For alcohol, over 31 percent of the 12 to 17 group are current drinkers, and 22 percent are current tobacco smokers. Current smoking is reported by about 40 percent and current drinking by 58 percent of the 18- to 25-year-olds. Thus, alcohol, tobacco, and cannabis are the substances most widely used by adolescents and youth, whereas heroin, the drug about which there is probably the most social concern, is but rarely employed. In terms of current use of the drugs of concern here, the picture differs little from surveys of 5 years ago, except for a steady cannabis use increase; lifetime experience, which includes experimentation as well as current experience, has increased dramatically in the 18 to 25 group, however. This constitutes a very large group of drug-wise young adults in the society.

Etiology and Description

A second issue has to do with why and how young people use drugs. There are myriad studies, most integrated into earlier publications (Blum et al. 1969a,b; Ray 1972). Recent work, consisting mainly of demographic correlates, user versus nonuser comparisons, clinical portraits, natural observations, and either followup or retrospective views over time, is quite consistent with earlier findings. A 1976 study (O'Donnell et al. 1976), for example, describes an association between extent of illicit use and extent of delinquency, intercorrelations among use (each additional drug used increased likelihood of other drugs being used), and correlations between more illicit use and urban residence, unemployment, less conventionality, and poorer educational achievement. In an anthology of papers on prediction of adolescent drug use (Lettieri 1975), one learns that drugs are accorded different meanings in the lives of users (Goldstein 1975; Kovacs 1975), that deviance in drug use is associated with other kinds of unusualness and that one can become preoccupied with a drug-centered life (Nurco 1972), that consistent or convinced drug users are psychologically different from others, being more interested in sensation-seeking (Segal 1975), and being low in self-esteem, coping, and psychological well-being (Norem-Hebeisen in Lettieri 1975, Lindblad 1977). They demonstrate ego deficiency and regressive tendencies (Naditch 1975), and high intensity euphoria-seeking in their early alcohol use (Block 1975). Several years prior to beginning use, users can be differentiated from others on the basis of being rated as more rebellious, untrustworthy, impulsive, and less self-reliant, ambitious, interested in school, socially accepted, and academically confident (Smith and Fogg 1975). Greater emotional distress is also a differentiating trait (Mellinger 1975). Intensive users may also be, in a selected academically successful sample, more creative (Mellinger 1975) and are more likely interested in humanities, arts, and the social sciences (O'Donnell et al. 1976).

Each of these findings is important but none are outstanding discoveries. To this point then one may say that the thrust of many recent findings, be these epidemiological, sociological, or psychological, is to confirm and extend earlier ones. However, recent years have allowed researchers to carry out more extended analysis and apply more thought to batches of simple cross-tabulations generated earlier in the fray of the drug panic. Two such summings-up are reported later in this section.

The work of the Jessors (1974, 1975) has been an innovative contribution to developmental conceptions. These investigators have shown that a number of social-developmental patterns are closely linked to drug use. One can, for example, make predictions about sexuality, academic performance, lying, cheating, fighting, and marihuana use simply by knowing alcohol drinking status. At whatever age adolescents move into the regular drinking group these other attributes merge so that by being a member of a group defined by its alcohol use, other social behavior becomes predictable. At the next step, cannabis use, the same principle holds. Cannabis use is a signal of departure toward more unconventionality, with lower value on achievement, more on independence and social criticism, more tolerance for deviance, less religiosity, less parental control and support, greater peer influence, more delinquency, and lower school achievement. Implied is greater conflict between older drug-using youngsters and their parents who remain conventional. Most of these attributes have been described in earlier student studies, but to see the configuration as a phase with drug use as the signal of transition, a tracer illuminating the pattern, is important.

Looking at one set of longitudinal data from secondary school children in 1971 and 1973, Elinson and his associates (1977) found some consistent predictors of initiation into marihuana use. They were either situationally determined or sociocultural: opportunity to use drugs, prevailing peer group norms, favorable attitudes toward drug use behavior, parental orientations toward deviance, and involvement in peer groups. Personality variables were not as consistent predictors. The authors caution us with respect to this latter conclusion, for personality was not measured in depth or detail, and only initiation into this popular drug, not heavy drug use, was the study's focus.

With respect to developmental findings, Kandel (1976), in a review and integration from a selected group of longitudinal studies, extracts the following 20 principles:

1. The period for risk of initiation into illicit drug use is usually over by the mid-twenties.
2. A high proportion of youths who have tried marihuana will usually go on to experiment with other illicit drugs.
3. Later age of onset is usually associated with lesser involvement and greater probability of stopping.

4. There are usually clear-cut developmental steps and sequences in drug behavior; use of one of the legal drugs almost always precedes use of the illegal drugs.
5. Addiction to heroin is not usually a permanent state.
6. Occasional use of heroin does not necessarily lead to addiction.
7. The dysfunctional attributes of drug users usually appear to precede rather than to derive from drug use.
8. Different factors are usually involved in the transitions into different stages of drug use.
9. Personality factors indicative of maladjustment usually precede the use of marihuana and of other illicit drugs.
10. Poor school performance is usually a common antecedent of initiation into illicit drugs.
11. Delinquent and deviant activities usually precede involvement in illicit drugs.
12. A constellation of attitudes and values favorable to deviance usually precedes involvement in illicit drugs.
13. There is a process of anticipatory socialization wherein youths who will initiate the use of drugs usually develop attitudes favorable to the use of legal and illegal drugs prior to initiation.
14. Drug behavior and drug-related attitudes of peers are usually among the most potent predictors of drug involvement.
15. Parental behaviors, parental attitudes, and parental closeness to their children usually have differential importance at different stages of involvement in drugs.
16. Sociodemographic variables usually hold little predictive power for initiation into marihuana.
17. Time of onset of drug use usually declines as degree of deviance proneness increases.
18. A social setting favorable to drug use usually reinforces and increases individual predisposition to use.
19. Nonaddictive illicit drug use usually does not by itself lead to increased criminality.
20. Cannabis use usually does not appear to lead to the "amotivational" syndrome.

By definition, principles are probability statements that ignore small deviations. To assure that the exceptions are recognized, we add qualifying comments to the above.

- Some parents are initiated into illicit drug use by their youngsters.
- Amphetamines may sometimes be the initial illicit drug rather than marihuana. (In fact, underage smoking and drinking are the usual illicit antecedents to use of the unlawful compounds.)
- Later age of onset also is associated with better treatment outcomes.
- In hippie families, young children may not start with legal drugs but be administered hallucinogens or cannabis before they can initiate their own use.
- Addiction is as much a role as a state. Physical dependence, the pharmacological condition, is intermittent and often terminated. The addict role requires intention, effort, and learning, whereas physical dependency, to be produced, requires repeated doses.
- Drug use can lead to bad outcomes, either acute or chronic, and repetitive use may further limit coping, judgment, and maturation.
- Maladjustment and pathological traits will not discriminate between users and nonusers when use is or becomes conventional in a population. Even then, though, some initial use will be triggered by individual psychodynamics as will be varieties of response.
- Peer influence dominates especially when families suffer or create conditions for it or reduce control. Although parental influence has different impact at different stages of drug involvement, there is some impact at any age.
- Age is a powerful predictor of marihuana (and most other drug) use. At the present time other sociodemographic characteristics do not distinguish strongly.
- Drug use may not inevitably create the amotivational syndrome, but acute effects of drugs easily impair judgment and motor coordination; and intensive use of some substances is incompatible with adequate social performance.

Observations and conceptions to date do offer etiological insights, as well as descriptive statistics. One may not be satisfied that one "really knows why" youngsters use drugs, but there are sufficient data to provide understanding within the limits of present general knowledge in the fields of child development, psychopathology, social psychology, psychopharmacology, delinquency, etc.

Trends

There are consistent trends in youthful drug use which are reflected in a public concern over an expansion in "abuse." Abuse, of course, is a quagmire word which can imply observer disapproval or anxiety, unconventionality in styles of use, or actual bad outcomes.

The evidence for trends is based, in some cases, on year-to-year data and, for other trends, changes over the span of a decade. Blum (1976), for example, has been following metropolitan California school children for 6 years. It is found that self-initiated use of alcohol and tobacco begins by grade 2, cannabis by grade 3, heroin and cocaine by the 5th grade. By grade 11, the majority of these California students have had experience with alcohol, tobacco, and cannabis.

Nonmedical drug use is spreading downward by age so that now in 1978 in many areas, it is an elementary school phenomenon. It is spreading outward geographically, from urban centers to smaller towns; indeed the latter are now experiencing heroin use increases at a faster rate than cities (Rittenhouse, J. D. 1977, see L. G. Hunt's "Incidence and Prevalence of Drug Use and Abuse," this volume). It is spreading over social class lines, hallucinogens downward, cannabis and heroin upwards and, with the latter, that democratization of delinquency which often attends extreme drug use. There is also a spread across sex role barriers, with girls now using as often, sometimes more often than boys. Multiplication of substances employed is another variety of spread, this including medications and OTC compounds as well as old standby illicits and newly popular laboratory products, as for example, PCP (phencyclidine) these last several years. A sixth spread is an increase in per capita consumption; alcohol foremost, but over a decade cannabis, hallucinogens, and opiates as well and, not to be forgotten, licit psychoactive prescriptions. A spread in consumption implies more frequent and regular users and, for many, increased dosage as well. As a result it may be that there is a greater risk of drug problems emerging, for at least some alcohol data (Bruun et al. 1975) show a logarithmic increase in problems as a function of per capita consumption rates.

There is, then, a steady expansion of "abuse" if defined by increasing prevalence/incidence rates among youth. What accounts for that expansion, what interrupts it, and are there genuinely damaging outcomes which grow visibly apace? These are indeed issues for research as well as natural questions from concerned parents or public leaders. Unfortunately, the link one would expect between etiological studies and the fact of expanded drug use is rather tenuous. Explanations are more likely to be couched in terms of general rather than specific forces as, for example, parental permissiveness and family disorganization, the large number of youth at peak delinquency ages, the facilitation of interest by advertising, medical practice, lack of discipline and expanded self-centeredness in children, and the like. These speculations are widely accepted, yet they constitute as much an expression of current social science perspectives—these, in turn, quickly adopted publicly—as facts derived from tests.

In Blum et al. (1976), one set of forces observed and manipulated was associated with change: classroom education. There one learns that, in the age groups just about to begin major drug experimentation, drug education does have an impact. It works primarily to reduce the chances for the use of less popular drugs (amphetamines, heroin, etc.), while speeding initiation of the use of the popular drugs: alcohol, tobacco, and cannabis. Our belief is that education may speed conformity to the drug-using standards of older youth, reducing individual variability along the way. That can be termed "socialization" but it certainly is not what is wanted or expected by educators. Who, after all, wants sixth graders regularly smoking pot? In another set of studies, Blum and Associates (1972) studied family life and drug use among offspring. There one learns that more permissive parents had children with greater illicit drug use. It was, however, the "problem" families, ones with much interpersonal distress (including acted-out psychopathology) where extreme drug use occurred and where the greater risk of danger to the using youngster appeared. On the basis of such work, one can say that the forces affecting the expansion of drug use include education and family factors. As these change, so does youthful drug use. Since nondrug delinquency and illicit drug use are also linked, some of the forces that generate delinquency will be antecedent to illicit behaviors that constitute drug use. We cannot review that literature here but do refer to Nettler (1974) for a sound review. His simplest conclusion? "Whatever destroys community fosters an increase in crimes." His criminogenic conditions? The movement of people, crowding, social mobility, child neglect and the misuse of youth, mass media, anarchistic values, unenforced laws.

As children and youth consume more drugs for nonmedical purposes, there may be an increase in ill effects. We have noted the finding of alcohol ill effects as a function of consumption levels, but no such data, pro or con, exist for children and drugs across the board. A minority of youngsters will report ill effects from any of their drug use. Earlier in Blum's (1964) work, studying adult hallucinogen use, it was learned that there is a discrepancy between what observers and users believe: What was defined as deterioration in their lives, LSD afficionados called a "realization of their potential." An observer watching a heroin user get sick may be surprised when the user says he was sick but "liked it." Thus, ill effects are not a matter of consensus.

Programs and Policy Affecting Trends

Presumably, not only can use per se be affected by "prevention" via school and childrearing, but also youngsters could be influenced to channel their use to safer drugs, or reduce consumption. For those who are committed to the drug life, it is assumed that various "treatments" are helpful interventions affecting trends.

It appears that treatment intervention, certainly in association with research, has not been considered necessary, either for those youth using popular drugs, such as tobacco or cannabis, or for those using substances where dangers can occur in acute use. Thus, one finds a treatment literature focusing on markedly deviant, debilitated or physically dependent, primarily older cases.

It has been left to education, as the sole formal institution with a public mandate, to control adolescent drug use. That effort applied to the conventional substances—alcohol, tobacco, cannabis—is well nigh a complete failure. It is left to time to see which young users become so involved in drug-related crime or illness that as adults they become "cases" coerced or persuaded into addiction treatment. The evidence shows (Platt and Labate 1976) that there is much spontaneous recovery, and that maturity is one of the greatest assets linked to abandoning addiction, so one might argue that waiting is as good a course as any.

Contrariwise, there is evidence that the earlier the onset, the more resistant heroin use is to either spontaneous recovery or treatment. Since the year following first use appears critical for addiction onset, and since use for over 3 years is negatively related to later abstinence (Platt and Labate 1976), early intervention would seem in order. Further, one finds (Blum 1972) that by mid-teens (age 16) the self-identification of an alcohol problem anticipates later heavy general drug involvement—including heroin addiction and crime. In addition, youngsters do suffer ill effects in association with drug use. These are all arguments for not ignoring adolescence as an important period for case finding, treatment, and research.

With regard to the choice of methods by which to respond to children's drug use, either before problems are evident or after someone has become a "case," not enough is known. One asks what the components are in the processes internal to "treatment," corrections, or prevention that account for positive effects. One also asks what seem to be the most promising general approaches, and where the priorities should be. Grizzle (1975) contends that classroom education, when compared to treatment or corrections, turns out to be the most democratic, cost-effective means for influencing children's drug use. That contention certainly requires testing. Our expectation is that educational effects of school will vary by drug category as well as by age and community.

TASC (Federal Treatment Alternative to Street Crime) diversion program—shunting first offenders with drug histories for nondrug crimes (almost all of whom, crime statistics show, are adolescents) to counseling—is one effort to do this. That effort remains unevaluated, and the question remains, what will work early to find high-risk youngsters and reduce their self-troubling and other troubling conduct?

Certainly prevention has been the stepchild; one is surprised to learn that school has any influence at all, for theories of drug use pay scant heed to rational processes and to education as their patron.

There have, of course, been sporadic extravagant mass media campaigns—many of which, we suspect, were aimed at Congress rather than the public—but no reason to believe in their effectiveness. Indeed, Woodcock (in Blum et al. 1976), reviewing mass media public health education programs, indicates failure is the rule. A happy exception is the recent campaign against habits prognostic of heart disease (Maccoby and Farquhar 1975). In that public effort, cigarette smoking was reduced in response to mass media efforts.

There is a strong rationale for teaching parents how to engage in that childrearing which reduces drug risks. Most parents do strive to do a good job, most do read childrearing literature, and this does seem to affect what parents do and, we believe, what children do subsequently. Parental values and styles do predict illicit use, whereas family pathology predicts high risk drug behavior. Stanton's (1977) review provides much corroborating evidence, including a finding to the effect that family therapy is considerably more beneficial than opiate maintenance in addict treatment.

There can be few issues more important to parents than that of "how to." Childrearing for drug safety is intimately connected to the role of the schools, for parents do rely on schools to give facts the parents don't know, to reinforce parental moralizing, to offer a reason to begin discussions in the home with respect to what drug use signifies. Indeed, our own clinical observations of clever teachers and wise parents suggest a remarkable similarity in how a "rational" discussion in which the child is invited to "think through" things and "come to his own conclusions" leads to conclusions very much in line with what these democratizing authorities had in mind. In any event, there is much to be done by way of testing parent training methods, classroom ones, and research on families for the elucidation of drug problem etiology. (See M. D. Stanton's "Family Treatment of Drug Problems: A Review," this volume.)

Individual Factors Affecting Drug Careers

Most youngsters do get into substance use, primarily popular substances that young adults employ, but most do not become drug extremists and, among those who do, a good many get out of the drug-centered life on their own. What are the strengths that contribute to controlled use, to being only conventional (even if that is not good for health, viz, tobacco and unsupervised alcohol use), or to getting out when one has been in too deep? The etiological studies do offer us much on differences between abstainers, moderates, and extremists (recall family strength, conventional peers, absence of rebellion, and personality disorder, etc.), but there are also some surprises. Studies of heroin users (Platt and Labate 1976) suggest these may be brighter than their peers. Deprivation? Hardly, for there is a paradox here; there is great consistency in showing that most types of nonmedical drug use increase with family affluence. There are subgroups—notably urban minority males—where poverty is implicated, as for heroin, but when examining individuals within these groups, the users appear to come from better rather than worse off families (Lukoff 1972).

With reference to drug use reduction, or the substitution of approved or disapproved for more dangerous compounds, there is a trustworthy literature. Generally, the factors which predict early or reliable "recovery" (i.e., drug conventionality, which can include expanded life interests and reduced dependency) are the same ones that predict progress in treatment in other mental health and/or delinquency areas. Good prognostic predrug or pretreatment traits include being well socialized, the absence of personality disturbance, and strong ties to other persons. A time-of-treatment trait of great importance is age which, when combined with a relatively good prior adjustment history, may also be called maturity. Treatment variables also matter, although less so; these include type of treatment as matched to the person (see Sells and Simpson Volumes I through V, 1976).

It appears as if treatment may work best on those who need it least. Indeed, Graeven and Graeven (1977) show that among heroin users, one group who do not bother to seek treatment are those whose heroin use is pleasurable, under control, and not associated with being identified officially as an offender. Why be treated when one is having fun and is not in trouble? In Zinberg et al. (1977), observations are of the same order, adding that group norms are very important in keeping things under control. That requires that people choose sagacious groups with which to affiliate. Cisin et al. (1976) confirm that quitting drugs comes with getting older, getting married, and having children. Stanton (1977), citing Eldred and Washington, says that users also know that personal ties are the most important features; that parents, in-laws, and spouses are the most helpful resources for terminating addiction. In Blum's work with drug dealers (1972), this group, too, spoke of how important others were as an influence on their getting out of drugs and crime. Direct personal influence of the positive sort; people who are strong, caring, and not condoning, may be essential for getting out. These same words describe the parents whose children are at low risk of getting into heavy drug use.

Religiosity

There is a different way out of drugs which is also associated with not getting in. It is religiosity. Youngsters from church-attending conservative families are very unlikely to become drug users (with exceptions, of course, for example, poor fundamentalists without strong families or with alcoholic parents). As for quitting, whether with alcoholism or heroin, conversion to and strong involvement with religious groups is a powerful device. We saw it in a study of reformation in young drug dealers, and it permeates Alcoholics Anonymous. Fervor, not faith, may be one component, viz, Synanon and psychoanalytic studies of dogmatism in addict personalities (Blum and Blum 1967). Felt personal power by way of religion might be another component if one extrapolates from McClelland (1975). William James (1954) brilliantly observed the spirit in the bottle, that diabolical mysticism, whereas Weil (1972) argues that since the quest for mystical experience is part of normal development, then so too is the use of chemicals that facilitate that. It is surprising, then, that among current investigators there is little interest in adolescent religiosity, either as accounting for drug preferences or the experiences reported. Anthony, Robbins and Curtis (Robbins and Anthony 1972, Anthony and Robbins 1974, Robbins, Anthony, and Curtis 1975) are happy exceptions, they describe the role that Eastern mystical sects play as a bridge to conventional values for drug-departing youngsters. Religion's influence in prevention, religious experience on shaping drug preference and styles of use preference, its role in cure are important, along with family factors, it may be paramount for subgroups of users. It is past time for better understanding of the part religion plays.

Preferences

In too much terminology, "drugs" are handled as one semantic class. Strong intercorrelations in use, substitutability, progressions, factor analyses of common core effects, and the variability of subjective interpretations of nonspecific effects all encourage one to overlook the fact that most people prefer one drug to another, one brand, or one formulation. We know almost nothing of factors guiding initial specific choices or later learned ones. There are pharmacological and social studies which compare one or another manner of administration, the clanship of the needle for instance, and the rush of the injection, but little on those initial acute reactions which lead a youngster to prefer one to another drug, independent of dosage, administration, and the like. The assembly of academic interest focuses on heroin. McAuliffe's (1975) revised view of Beecher's work indicates that many heroin users really do enjoy opiates on their first shot, and that the rate of euphoria over dysphoria in a random population on first exposure to morphine may exceed Beecher's (1959) 10 percent estimate. A good start, but only that; and much can be done with reference both to personal and to social preferences. In 1970, one of us predicted that our society requires more calming down then pepping up, and forecasted more relaxation via alcohol, cannabis, opiates, etc., than strong stimulant use. It was convenient then to discount massive caffeine intake on the basis of the relative mildness of doses and reactions to tea, coffee, and cola, but that is indefensible. How, in fact, does the individual balance and select his/her coffee pep against his/her cannabis calm? Why do some need coffee, others love Scotch, others admire cocaine as "queen of highs"?

Psychophysiology

One approach to preference specificity is to continue looking at those users whose criminal and symbolic presence is of such concern: the heroin addicts. Drug investigating psychologists should not have to be reminded that theirs is also a biological science and that pharmacology must be included in their predictive matrices. Some pharmacologists are well ahead in cross-disciplinary awareness. Findings that self-administration rates for alcohol do not vary at all between physically dependent and nondependent animals, that humans with tolerance and physical dependency do demonstrate clear control over alcohol intake suggest that it is not dependence that determines preferences expressed in compulsive use. Unexamined as yet is the psychophysiology of the heroin interested youngster (13 percent of those aged 12 to 17), particularly those factors that may lead to understanding of the most common diagnostic group within the addict set, the psychopath. Following the early findings of Lykken (1957), pursuing the fine work of Hare (1970), and culminating in the powerful studies of Mednick and Christianson (1977), there is good reason to believe that psychopaths have different autonomic nervous system response patterns compared with normals. These involve diffuse high resting levels and nonresponsiveness to fear conditioning. Why not postulate that the powerful medication, heroin, may provide an emotion differentiating experience which also perpetuates nonlearning of what for others are the adverse lessons of extreme drug involvement? There is also evidence for the heritability in males of alcoholism. Schizophrenia in mothers is reported to contribute to male offsprings' criminality, along with the contribution of parental criminality. We can think of no area of work more important than further testing of these genetically linked psychophysiological theories which, so far applied only to criminality and alcoholism, seem so ripe for exploration among adolescent drug users, particularly compulsive users destined for the addict role.

Criminality

"Drug abuse" has become such a field in itself that its practitioners sometimes forget that their clients are by legal definition delinquents, and for those heavily drug involved, there are likely to be continuing nondrug crimes as well. The heroin addict is the perfect example, the addict life is a criminal life. The criminal personality as such has been observed with new insight by Yochelson and Samenow (1977).[1] Central is the description of the very early emergence of predatory conduct (by age 6) which can occur in spite of noble parental efforts. The authors describe the existence of a special logic system, the readiness to commit crime at all times, the immense number of offenses accumulated. The authors, as clinicians, also propose a treatment method. So provocative is Yochelson and Samenow's examination of the lifetime commitment of these core recidivists whose actions are *not* explicable on environmental grounds that we must encourage pursuing their leads. It is possible that there is an overlap between their subgroup and the psychopaths with autonomic nervous system anomolies. If not, then here is a second subtype of extreme criminal drug user.

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[1] A third volume on drug addicts is in preparation.

Taste

Preference as a function of initial reactivity is an area demanding further investigation, this following from the discovery of Joyce et al. (1968) and Pan et al. (1970). They observed that the degree of activity of several tranquilizers is predictable from taste thresholds. The mouth anticipates bodily sensitivity. Since taste sensitivities vary by developmental state, longitudinal work on children and adolescents is in order.

Paradoxical Recall

One of the most striking features of initial drug use is paradoxical; youngsters try a substance, such as alcohol, cigarettes, LSD, cannabis—or for that matter heroin—and become ill. Instead of learning not to try it again, they repeat the experience. Elemental learning theory seems negated; what cognitive or emotional factors are overriding? Hollister (1968) found that what people say they experience during the acute phase of first drug use is not necessarily what they recall later. An elaborated concept of the structure of response arises from integrating these inconsistencies with state-dependency learning in association with anxiety reduction (Meyer 1974), and affectivity levels (Dutta et al. 1972). In any event, one wants to know if the degree of discrepancy between a youngster's acute drug experiences and later recall is itself indicative of some restructuring process which predicts drug preferences and later use patterns. We have elsewhere elaborated our expectations in this area (Blum 1976) to the effect that past is presage.

For the most part, theories (Lettieri 1978)—or their components—have been borrowed from the current thinking of the major disciplines with which drug investigators are identified; thus one sees (as illustrations borrowed from psychology) variants of behavioristic learning, social learning, psychoanalytic doctrine, existential and self-potentiating systems, and the like. From sociology, one finds applications borrowed from deviance, "structural" (demographic), social control, symbolic interactionist, cultural, environmental, and economic approaches (Richards 1977). These differences of theory seem to make little difference either to the progress of research or the interpretation of data. Much work is description and ad hoc analyses, and when hypotheses are involved, these are of a general order. They demonstrate the application of existing methods and concepts to drug-using populations, but are not critical tests at the cutting edge of a logical enterprise which also serves to integrate all available knowledge at any given level of observation.

There are exceptions. In pharmacology, investigations on opiate receptors and opiate-like neurohumours, the enkephalins, do give rise to an internally consistent, exciting, and hypotheses-generating theory. These are truly basic studies that cannot be duplicated in the psychosocial fields without parallel financial support for basic cross-cultural studies of deviance, development, and social change.

Radical sociology and radical psychiatry offer, at an antimolecular extreme, theories derived from drug phenomena per se. The emphasis is on the value systems and class interests of those who fear or oppose those forms of drug use termed "deviant." Drug use itself is considered a natural development depending upon such natural features as availability, subgroup approval, pharmacological gratification and, as in Young's (1973) proposal, its problem-solving utility for disadvantaged persons. Such theories focus on the stigmatization of users; as an expression of powerholders of their antipathies toward the values held by the powerless and unconventional. By labeling use as criminal, one creates the observed psychopathology and extreme conduct, e.g., addicts and freaks. Abuse, it is claimed (Young 1973) is of power by the rulers, not of drugs by the youth, and pathology then is not in personality but in the moral political defects of elites. A related philosophy, albeit rich in religious imagery and heretical scholarship, is found in Szasz (1975), who focuses on the struggle by medical and scientific professionals to gain power by labeling drug use as illness or deviancy. The personal preferences of normal people become, in the process, excuses for making them society's scapegoats.

An intermediate and more useful theory arising from drug use observation is focused on the influence of institutionalized norms as primary to the emergence and definition of drug problems. In essence, it holds that where institutions and group norms are weak, variability in drug conduct is great. Under those conditions, that variability will generate both individual problem behavior—including adverse effects—and judgment of abuse (Blum and Associates 1969a). Abuse control will come when standards exist which control variations in use, particularly those with high risk of untoward effect (Zinberg 1977).

RECOMMENDATIONS

There derive from existing studies and our reflections, recommendations for action in treatment, prevention, policy studies, and basic research.

Treatment

Most treatment in the drug field is for older cases clearly dependent or debilitated, or for diverted delinquents. Only the latter includes adolescents. Yet, there exist at least three groups for whom experimental treatment programs should be considered: (a) those whose school and personal adjustment is poor, presaging later rapid and extreme drug involvement; (b) those whose drug use is already extreme and poses hazard of acute ill effects and longer term poor adjustment prospects; and (c) those whose drug use is extreme and who are already aware that they have a "drug problem." Most often these will be multidrug users whose excessive alcohol use, with subsequent ill effects, is a matter of awareness. Early intervention suggests itself from the basis of our California data; the first critical drug transition period occurs by age 10, another by 14, another in mid-teens. That same study showed that the fewest proportional referrals to helping agencies were for students in the extreme drug-use category, even though among them were the highly visible group of chronic troublemakers.

The usual treatment-and-research challenges must be faced: case finding which is effective but does not create a stigmatized or coerced group, referrals to resources able to handle these often difficult youngsters, determining which treatments work for whom, as measured by reliable followup criteria, and financing the effort. In addition, one wants to prevent the institutionalization of treatments by vested interests until such time as there is evidence that the interventions are cost effective.

There are two widely discussed efforts, the Federal TASC delinquent diversion-to-counseling, and the New York City SPARK school case-finding-to-special-programs-and-counseling. Claims for success are made, but one awaits objective, well-designed followup reports.

Prevention

Schools. We estimate that as much as $500 million a year may be spent nationwide in "drug education." We affirm that drug education has an impact, but also that most curricula are not heedful of the few curriculum impact studies done to date. Certainly, the proportion of research funds spent on prevention of any kind has been minimal. Given the fact of impact—positive and negative—and the apparently irrevocable commitment of school systems and families to the job, why not spend more money finding what teaching methods work best for which children in what communities?

Family. Most parents want to be good parents; most seek guidance as to how to rear their children, especially in new areas, such as drug use, where parents are anxious, uninformed, and without successful guidelines from their own past. Certainly, family studies show that what parents consciously intend to do matters, and that what happens within families psychodynamically, at less than conscious levels, also is important. Where, then, is the commitment to the support of family research aimed at helping parents to prevent undesirable drug conduct and outcomes? How does one reach and teach parents?

Religion. Church and state are wisely separated, but religiosity and drugs are not, although the powerful correlation is negative. Perhaps religiosity is only a correlate of community-integrated morality and conventionality, although some propose it is an intuitive developmental imperative or, as with William James, a mystical potential awaiting release. Certainly some drug experiences suggest the latter. As an action area, it is first a matter of legal opinion. What kinds of experimental prevention programs may be federally supported? If supportable, why not a diversity of applied tests? Prior research is prerequisite to the design of any field test.

Policy Studies

Comparing interventions. Policy research implies definitions of alternatives, estimates of impact, criteria for cost/benefit analyses. Applied to drug policies, the meticulous data required for systems and economic forecasting have been absent even though the rhetoric of pretense is much in evidence. Nevertheless, even gross comparisons can be helpful. Is Grizzle (1975) correct in claiming that for an overall State level effort, the best bargain is classroom education compared to treatment or corrections? Policies, felt need, and institutional self-interest will prevent any sudden and massive shift in resource allocations, but managers and legislators are responsive to data over time (think of the decriminalization of marihuana and drunkenness, bans on cigarette advertising and use, controls on amphetamines, proposals to allow heroin's use as a medical analgesic and anesthetic). For the rational evolution of policy, comparative studies of interventions are necessary.

Federal trends. There has been a marked shift over the last three administrations to research by objective, that is, an emphasis on bureaucratically defined "practicable" studies. As part of this, there is a growth within Government of Federal RFPs (requests for proposals), a hit-and-run contract research industry, and funds directed by Federal managers rather than "outside" scientists. Most funds so assigned do not go to basic research, nor, it is our impression, do they go in the drug field either to child development or other social and psychological work. In clinical medicine, at least, practical "cures" owe more to basic than programmatic studies (Comroe and Dupps 1976). No doubt the allocation of funds comes from decisions based on political impulses, beliefs as to the nature of science, and the power of competing managers and disciplines. (In basic drug research, the pharmacologists and biological scientists have won hands down, by an order of magnitude within NIDA of six to one.) Yet one can subject these strategies to analytic review. We propose that one study the allocation decision process itself.

Research

Ill effects. Although the field of drug studies travels on the passport of "abuse," the differentiation of kinds and magnitude of adverse outcomes is by no means refined. The assumption that all children's drug use is "bad" reflects morality, perhaps wisdom, but one does not know the prevalence of which kinds of "badness" by kind of drug, setting, manner of administration, and biosocial characteristics of the child. The inadequacy of existing drug classifications and complexity of their reconstruction has been elsewhere examined (Blum et al. 1974), yet that reconstruction is needed if one is to base law, education, or other action on priorities empirically generated as to what is damaging for whom, when, and with what probability. Perhaps the ghost of the cannabis "amotivational syndrome" has been laid to rest, but no hint of certainty colors discussions of the role of chronic drug use during various developmental epochs, as for example, on motor skills, cognitive learning, social learning, ego formation, or coping behavior. Can it really be that the chronic "pothead" in the sixth grade is unaffected by his drug use per se?

The victory of etiology in deviance studies has been so heralded that now it is known that extreme drug users can be identified on the basis of earlier conduct—indeed sometimes from preconception parental traits—that most of the misbehavior that clumps as deviance seems to be assumed to be fated. Alternatively, the etiology is denied—as in labeling theory—and the cause attributed to the observer's values and institutions. Somewhere in between lies a great space for work on the acute and longer term sequential effects of powerful substances, studies by age, sex, and setting. We expect, for example, that drugs do serve as key switching points for various developmental tracks.

Specificity of drug preference. For all the substitutability, general predilections, intercorrelations, and cyclical alterations, specificity of preference exists and is not understood. This is separate from the constraints which sense or conventionality places on drug choices, or symbols, which attach to drug-related roles. One finds preference as a function of age (vividly illustrated in the use of volatile intoxicants, inhalants, which begins, peaks, and disappears over ages 8 to 12 in California). Research on drug effects and experiences which predict to preference development and, presumably, to expanded use, is imperative. Taste thresholds, paradoxical recall, and religious experiences are worthy areas for work. Personality as such, for instance as shown by McClelland with reference to power fantasies and alcohol, deserves continued study. The early work of Becker (1963) on the teaching of cue differentiation as part of peer initiation into cannabis use also provides a framework, as do the Jessors (1974), for interrelating social with physiological learning. Certainly one wants to learn more about the differences between youngsters reacting euphorically and dysphorically to different compounds under blind and controlled conditions.

There is important work to be done, following the Lykken-Schacter-Hare line, on psychophysiological anomolies associated with the autonomic nervous system base line levels and emotional experience differentiation for psychopaths, since psychopaths constitute the primary diagnostic group among heroin addicts. Perhaps youngsters with these anomalies will be most responsive to powerful depressants as a means of providing differentiable autonomic experience, while at the same time being insensitive to the fear-learning which ought to accompany both the delinquency and the disruption of ego functions. State-dependent learning is a variable which suggests itself as operating in this context. The possible genetic transmission of a psychophysiological anomaly, as suggested by Mednick et al. (1977), demands study experimentally and longitudinally in youth populations entering transitional periods when these unsanctioned substances become available. Studies on early response to alcohol in these populations are also in order.

Conformity. Welcomed as a safeguard against extreme drug use, changing drug opportunities and habits among children make conformity also a danger, viz, widespread alcohol, tobacco, and cannabis use by the end of elementary school years. While social change and public health education have altered conventional drug use among adults (historically in America, relative alcoholic spirit consumption has decreased, and recently millions of adults have quit smoking), the uptake of potentially dangerous habits among youngsters, for instance, greater smoking uptake among girls than boys, remains worrisome. If, as we suspect, the major impact of drug education in schools is to speed conformity to older peer conduct, how are we to reduce conformity in the direction of greater control rather than greater drug use variability? The question requires better understanding of the growth of benevolent autonomy in child development, particularly that which seems to immunize youngsters against widely practiced proximate drug use and delinquency in their neighborhood, or among their parents and siblings.

The concept of differentiation has been useful to development psychologists as well as to biologists. Perhaps it can be applied in the study of self-concepts and of moral and cognitive development, à la Piaget (1952) and Kohlberg (1969). At highest levels of moral development, the capacity for independent consideration of ethical principles emerges. What levels of moral and cognitive maturity are required, coupled with what ego autonomy, to allow a child to select safe models, utilize information rationally, insulate himself/herself from peer pressure so as to develop safe and, thereby, necessarily nonconforming drug-use habits? The extensive literature tells us of class, family, and attitudinal correlates, but we remain uninformed as to individual developmental structures and processes. There has been a necessary, but by now sufficient, set of studies with reference to drug use description, social forces, and broad correlates. It appears appropriate at the present time to focus once again on the study of individual development in its cultural context.

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25. Drug Misuse by the Elderly

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INTRODUCTION

The growth in number and proportion of the aged population is a relatively new phenomenon. Although dating back well over 100 years, this pattern has continued throughout this century. In the United States we have seen a change in life expectancy at birth (L.E.$_b$) from 47.3 years in 1900 to 72.5 years in 1975. Of considerable importance is the correlated finding that the 1900 L.E.$_b$ of 46.6 for males and 48.7 years for females has advanced to 69.4 years for males and 77.2 years for females in 1975, a major change in the pattern of survival between the sexes. It is noteworthy that while only 40.9 percent of the population reached age 65 during the period 1900-1902, 74.6 percent of our population were reaching their 65th birthdays by 1975; 64.5 percent of women reached age 75, but only 42.4 percent of men (U.S. Public Health Service 1977). Myers (1977) points out that this trend will continue well into the 21st century and also that the oldest portions of the population (those 75 and older) will continue to grow at a rate faster than the aging cohort (65+) or the population as a whole. Hauser's analysis (1976) of the world population confirms this pattern, emphasizing that while these changes have emerged largely among the more developed countries to date, the impact upon "less developed" countries has already begun and is clearly going to accelerate.

THE POPULATION AT RISK: PROBLEMS OF DEFINITION FOR RESEARCH ABOUT POLICY

The definition of the term "aged" is itself a complex issue. In France the concept of le troisième âge (the third age), i.e., life postwork, has been used popularly. In much of the world, age 65 is the traditionally used entry point into old age. Although this is a reasonable operational concept, it should be recognized as primarily a social definition related to retirement programs. These programs are dominated in the United States by the Social Security System (Old Age Survivors Insurance) which provides full benefits (to retirees) at age 65. It should be noted that there are significant pressures to reduce retirement age, though shortening work life, and the negotiation of 30- and 20-year work contracts is becoming more frequent. There are counterforces working toward making mandatory retirement (at 65) illegal and extension of the anti-age discrimination law to at least age 70. Thus, social definitions are in a state of flux.

Social gerontologists are now also distinguishing between the young-old (age 68-75) and the old-old (76 and older). This dichotomy appears to have rather important implications for prevalence of disability and disease, health care, and economic as well as other social policy issues. The Federal Council on Aging is now drafting a policy entitling all persons over age 75 certain services as "frail elderly." In this chapter we have adopted a flexible approach, and while in general we adhere to age 65 as the definition of aged, we also recognize that individual studies vary on this issue.

Despite minor differences in definition, it seems obvious that these demographic developments will require that considerably more attention be paid to social and health policies affecting the aged, since the needs and pressures of the aging will have a decided effect upon a society's ability to cope with the widest array of human problems at all ages.

To paraphrase Myers (1977), we must shift from death as a central concern to "continued existence as a problem."

Of particular concern is the fact that the aged are a population at risk. In societal terms the growing proportion of elderly increases the dependency ratio by increasing the proportion of individuals out of the labor force and therefore the proportional responsibility of the individual taxpayer. Complicating this equation is the fact that aging brings with it a greater risk for health problems, disability, and the need for institutional care (Kovar 1977). Mental and emotional difficulties of the aged are also major problems, although poorly addressed in the community (Kramer et al. 1973), and as such become major components of the need for long-term care (Kovar 1977, Kramer et al. 1973).

The physical and psychological changes of the aged are frequently complicated by problems of social isolation secondary to loss of spouse, separation from or loss of friends and other family, income loss, and frequent rolelessness (Chown 1977; Pfeiffer 1977). Other problems include frailty and fear of assault (in many metropolitan areas), loss of somatic or psychological abilities, a shift to a more female culture, and, perhaps in the aggregate, a failure to prepare for unexpected longevity. All of these and other factors contribute to a complex set of bio-psycho-social problems affecting many aged. While the majority of older persons remain well adapted throughout life, it should be recognized that with increasing longevity past age 65, problems will undoubtedly increase.

STUDIES OF DRUG USE, MISUSE/ABUSE

Studies of drug abuse (misuse) among the elderly have not been popular. Research into drug-related problems has focused attention on the illicit drugs or street drugs and narcotics and use of licit drugs outside of medical supervision. While such problems do exist in some measure among the aged (Pascarelli and Fischer 1974), some authors feel that addicts tend to die young (Capel et al. 1972) or grow out of their addiction (Winick 1962, 1964, O'Donnell 1969). Pascarelli and Fischer (1974) dispute this contention and propose that with advancing age older persons switch their abuse patterns to licit (prescription), primarily psychotropic, drugs and alcohol.

Methadone maintenance programs appear to be a source for identifying older addicts. Pascarelli and Fischer (1974), and Capel et al. (1972) report that for the aging addict there emerges a pattern of shifting drug use as a function of availability and economic necessity at a given point in time, but characterized by decades of long patterns of dependency. Schuckit feels that the existing information on elderly opiate abusers is only the tip of the iceberg,[1] only 5 percent of methadone maintenance patients are above the age of 45. In general older persons are not arrested and rarely get into the criminal justice system; instead they are protected and supported by physicians and/or family and friends.

The extent to which this pattern (shifting single drug use of opiate substitutes) is only a cohort phenomenon is raised by some authors (Pascarelli 1974, Schuckit[1]). It may be that with the aging of our present group of younger, multiple drug-using addicts, the pattern will change. Indeed, many patients on methadone also use depressants, including barbiturates, and barbiturates represent one of the most serious problems of drug misuse among the aged, accounting for 14.5 percent of all drug deaths reported in the DAWN system for the first quarter of 1976 and almost 20 percent of deaths when this is added to deaths from barbiturates combined with other hypnotics. Since the elderly show both paradoxical effects, i.e., agitation and hyperirritability, and greater sensitivity to the depressant qualities of barbiturates, the use of barbiturates is associated with particular problems in older persons (Gershon 1973). Barbiturates remain among the most troublesome drugs in terms of misuse potential but are still in relatively frequent use among the aged. A barbiturate, Seconal, was prescribed almost 1 million times to persons over the age of 60 during 1974. In fact, this group received 30 percent of all Seconal prescriptions that year (Basen 1977). Even mild analgesics such as propoxyphene hydrochloride (Darvon) have decided abuse potential, as do nonnarcotic analgesic agents (Jasinski 1973), and these drugs are often used by the aged.

It is not surprising in this context that while the aged comprise approximately 10.5 percent of our population at this time, they use 25 percent of the prescription drugs (Basen 1977). Both the vast amount of drugs the elderly use and their taking of various drugs simultaneously contribute significantly to the chances for misuse of drugs. Raskind (1976) has reported that drug misuse was the most important single source of pseudodementia (acute brain syndrome) among the group of aged persons referred to the Seattle-King County program of Outreach to Older Adults. He estimated that 26 percent of his patients showed drug-related problems of cognition. One of five patients entering the geriatrics units of general hospitals was also reported to display drug-related problems (Wynne and Heller 1973).

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[1] M. A. Schuckit, Geriatric alcoholism and drug abuse. Testimony before the Subcommittee on Alcoholism and Narcotics and the Subcommittee on Aging of the Senate Committee on Labor and Public Welfare, June 7, 1976.

Pascarelli and Fischer (1974) carried out an investigation of 360 poor persons in a residence hotel. Eighty-six of these subjects were 60 years or older. The majority were female, and they ranged in age from 50 to 88 (mean 69.5). The most frequent diagnosis in this group was alcoholism (12 percent), and among those surveyed 9 percent were diagnosed as schizophrenic. These 86 subjects were on an average of 2 medications on a regular basis with 105 prescriptions for psychoactive drugs and 67 as medication for other illnesses. Darvon was the most prescribed drug (23 percent) with chlordiazepoxide hydrochloride (Librium) second, followed closely by diuretics, digitalis preparations, acetominophen (Tylenol) and diazepam (Valium).

Of particular consequence in this survey, which admittedly is focused upon a poor population in somewhat atypical (though not exotic) living circumstances, is the potential problem which emerges of alcohol-medication interaction among older persons.

Guttman (1977), in a study of drug taking among the elderly in the Washington, D.C. area, reported that for his sample of 447 aged, who reported higher education and income than the general population of aged in the United States, 13.6 percent used prescribed sedative or tranquilizer medications on a daily basis, 5.8 percent used analgesics regularly, 1.1 percent were on antidepressive medications, 2.7 percent were on unspecified "nervous system" drugs, and 9.6 percent used drugs in the "other" category. Cardiovascular medications were the major category of use. In toto, 62 percent of those sampled used prescription drugs daily. Of interest is the fact that approximately 40 percent of those surveyed felt that they were dependent upon their drugs for maintenance of regular daily activity.

Equally impressive is Guttman's report (1977) that 55 percent of his sample used nonprescribed, i.e., over-the-counter (OTC), analgesic medications, with 25 percent using such medications daily and an additional 7.8 percent using OTC analgesics one or more times a week. In this sample alcohol was used daily by 18.6 percent of the sample, while an additional 24.6 percent drank a few times a week to a few times per month. While the majority (56.2 percent) reported little or no use of alcohol, more than half of the subjects used prescribed drugs in combination with OTC drugs and/or alcohol. Males tended to use more alcohol than OTC drugs; females used more drugs than alcohol. Guttman reports that the acquisition of prescription drugs outside of legal pharmaceutical channels is not a frequent occurrence in his sample. Of this survey's respondents, 98.7 percent reporting psychotropic drug use indicated that they obtained their sedatives, tranquilizers, or antidepressants legally (i.e., with a physician's prescription). Others, however (Schuckit;[2] Raskind 1976), indicate that particularly among aged in congregate housing, the trading of drugs and "inheritance" from deceased neighbors may constitute a hazard.

An analysis of the criterion variables for drug use studied by Guttman (1977) yielded the finding that primarily health, as well as knowledge of resources, perceived capabilities of other older adults, and physical disability were the major predictors of prescription drug use. For OTC medications, age, poorer health, and less satisfaction with life, as well as knowledge of resources, were significant indicators. Greater income was associated with more alcohol use, and knowledge of resources and life satisfaction were additional predictor variables. In sum, despite his findings that the great majority of elderly drug users of legal drugs seem to be using them appropriately, a potential danger appears to exist with certain portions of the population.

IMPLICATIONS FOR CLINICAL CARE

In one of the few detailed studies of its type (Hemminki and Heikkila 1975), the misuse of prescription medication was noted to be correlated with the number of drugs being used and the nature of the drugs. Those medications used primarily for symptom relief as opposed to cure of a disease, those with side effects, expensive drugs, and those for which the patient felt no further need were more likely to be misused according to this survey of 217 elderly people in Helsinki. Drugs related to sleep, appetite, mood, and the like are most likely to be abused, and patient noncompliance was a factor in 50 percent of the psychotropic or symptomatic drugs prescribed. Underuse and self-adjustment seemed the most common forms of noncompliance, while this pattern probably accounts for the fact that drug-related problems are not prevalent. Self-medication, however, has severe risks, as already indicated. Hussar (1975) suggests that noncompliance is related to long-term drug use in the chronically ill, those who live alone, psychiatric patients, and multiple-drug users. It is significant that comparable U.S. data are lacking. Doyle and Hamm (1976) indicated that there was a good deal of self-medication and that only 43 percent of a group of 405 patients aged 60 and older were fully compliant with their prescribed medication.

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[2] See footnote 1.

Patients in long-term care are not immune from the problems of drug misuse, despite their supervised state. The approximately 5 percent of older persons who are in nursing homes and long-term care facilities at any one time are particularly vulnerable and tend to receive a high proportion of psychoactive drugs. Indeed, the IMS America (1974) report of leading drugs used in nursing homes shows that psychotropic drugs were the most frequently ordered drug class in a report of 131 nursing home patients from July 1974 to July 1975. In one study of this population, Ingman et al. (1975) found that 90.2 percent of all patients were receiving psychotropic medications. Beardsley et al. (1975), studying five nursing homes in Minneapolis-St. Paul, however, found approximately 35 percent of patients on psychotropic medications regularly. Beardsley and his colleagues did find, however, that more than 35 percent of all patients had orders for hypnotic or tranquilizing medication PRN (i.e., as needed, a term giving discretionary powers to nurse and/or patient), although such an order was not warranted by chart review. A report of the U.S. Senate's Special Committee on Aging (1974) suggests that many patients receive drugs without the benefit of physical examination, have relatively poor physician management and poor nursing care, including such things as blood pressure measurement, and that the number of patients on psychotropic medication is excessively high.

While there is much concern and anecdotal literature on this subject, major studies of drug use related to patient need are still lacking. Given the serious problems of psychotropic drug use and misuse among the aged, including cognitive and sensory (Dawson-Butterworth 1970; Simon 1970; and Stotsky 1970), as well as physical (Davis et al. 1973; Raskind and Eisdorfer 1976; and Dynes 1970) disturbances, such studies seem warranted. The problem of side effects of "safe" doses of medication is not addressed in this chapter but certainly constitutes a major issue compounding the problems of drug misuse (Eisdorfer and Stotsky 1977).

BIOLOGICAL ISSUES IN DRUG USE AMONG THE AGED

With aging, the human body undergoes significant alterations in physiology which affect drug use. The pharmacokinetics of drug action involve absorption, transport, localization of the agent in body tissue, the metabolism and excretion of drugs, and the sensitivity of the target organ or receptor sites to the drug(s) (Friedel 1977). In addition there is also the problem of interaction of multiple drugs within the body.

Humans do not age uniformly, and there is an increasing variance in many measures with increasing years postmaturity. It is not surprising then that the aged show greater variation in clinical response and in side effects to drugs, and that pharmacokinetics in the aged show variations in opposing directions (Friedel and Raskind 1977). Absorption is affected by a variety of conditions, including the route of administration, stomach contents (i.e., administration before or after a meal, as well as the quality of the meal), and the state of the liver, kidneys, and circulation. Drugs and/or alcohol, which may impair liver or kidney functions, may serve to increase the effective range of a drug by reducing the ability of the body to metabolize the drug, or of the kidney to excrete it, with resultant shifts in bioavailability. While absorption may drop in many instances among the elderly, the sensitivity of the target organ to the drug may increase (Frolkis 1977).

The shift in the aging body to a higher content of fat (adipose), as well as the loss in number of cells of certain target organs (e.g., the central nervous system), will obviously also affect drug action. With greater proportional fat to protein, many of the psychotropic drugs (which are lipophilic) will be absorbed in the fat, with the result that less will be available for drug action; but with cessation of drug administration, blood levels may remain higher for a longer period of time, since there will be supplies stored in the adipose tissue. On the other hand, the general increase in the direction of increased density of lipids in central nervous system tissue may result in either decreased intensity or increased duration of effect.

The central nervous system, which is the principal receptor site for most psychotropic agents, is perhaps the most sensitive organ system in terms of the response of the aging. A variety of changes, including the loss of neurons, result in paradoxical and sensitivity changes, only a few of which have been documented. It is reported that the sedative effect of many psychotropic agents is more pronounced in the young, perhaps due to end-organ sensitivity or decreased cellular density (Salzman et al. 1970). On the other hand, diminished blood flow to the target organ may decrease the rate of availability of drugs and act at the absorption site to decrease drug absorption (Friedel 1977).

What is impressive is that in the face of fairly dramatic changes in the physical factors that affect drug use, and given the dramatic increase in drug use among the elderly, little is known about the actual mechanism of drug metabolism and the pharmacokinetics of the aged. An improved base of knowledge of pharmacokinetics applied to aging is of profound importance in our attempt to better understand the effects of drug use among the elderly, including dosage regulation and potential misuse.

CONCLUSION

It is clear that new knowledge must be brought to bear on the array of issues affecting drug use and misuse among the elderly. Data ranging from the somatic changes accompanying age and their influence on drug metabolism and efficacy, to the effective and safe ranges of drug dosage are lacking. Equally absent is information on the various psychosocial influences on medication use and on the importance of the cohort effect.

The current generation of aged are major users of drugs. Whether the cohorts of aged in the future, influenced by a still wider use of medication prescribed and self-administered, will be more or less inclined to use drugs is difficult to predict. One thing is clear—with increasing proportions of aged persons, increasing longevity among the aged, and the given current patterns of behavior, drug use and potential for misuse will continue to develop as a national problem.

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26. Depression in Narcotic Addicts: Quite Possibly More Than A Chance Association

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INTRODUCTION

The literature is unclear on the relationship between psychopathology and narcotic addiction. Some find (Pescor 1943; Pfeffer 1946) that addicts have no psychopathology other than personality disorders, while others (Wurmser 1972; Hendin 1975) feel that almost all addicts have serious pathology in addition to personality disorders. Many studies have attempted to identify a psychopathology that is specific to addiction but none have succeeded. In fact, these studies are often confusing because they report differences in type and amount of psychiatric disturbance. Several MMPI studies have found high levels of psychopathology in civilian addicts (Gilbert and Lombardi 1967; Hill et al. 1960; Sheppard et al. 1973; Sutker 1971), but a recent study of Vietnam veterans identified as heroin abusers has found evidence of lower levels (Hampton and Vogel 1973). Another similar study found high levels (Black 1975). These varying results can be influenced by the diagnostic framework used, by beliefs of the investigators, by the time in the addiction cycle when patients are examined (on methadone, drug free or in withdrawal), or by demographic characteristics of the population. Black's patients may have been selectively referred on the basis of greater psychopathology, while Hampton and Vogel's were referred on the basis of better personal adjustment. Hendin's diagnostic framework was based on psychoanalytic concepts of ego psychology, while that used in Minnesota Multiphasic Personality Inventory (MMPI) studies is more like the classifications in general psychiatric diagnostic manuals.

There is evidence that the severity and amount of psychopathology is inversely related to the degree of social pressure against addiction that exists within the patient's social and economic class (Kernberg 1977; Kaufman 1974). This may explain why De Leon (1974) and Fraser et al. (1961) found that psychopathology was related to sex and race, and why Hampton and Vogel found less psychiatric illness in Vietnam veterans than was found in earlier studies of civilian addicts. Troops stationed in Vietnam used heroin under circumstances of ready availability and social acceptability; thus psychiatrically healthy people were more likely to use heroin than they would be in a community where one would be breaking most social customs by doing the same thing.

Evidence that Depression Is Associated with Addiction

Most studies, though, have found that depression appears commonly and consistently in addicts. Frederick et al. (1973) studied several groups of addicts and found a significant elevation in suicide attempts. Only black male nonaddict controls made suicide attempts as frequently as the addict groups. Other studies (Vaillant 1966; O'Donnell 1964; James 1967) have also found considerable increases in suicide.

Many MMPI studies have found a relationship between depression and narcotic addiction (Sutker 1971; Gilbert and Lombardi 1967; Robins 1974; Fraser et al. 1961; Henriques et al. 1972; Lombardi et al. 1968; Olson 1964) as have studies using other methods (Helzer et al. 1976, Nace et al. 1977; Lehmann and DeAngelis 1972; Vaillant 1966; Weiland and Sola 1970; Frederick et al. 1973; Noble and Barnes 1971). Weissman et al. (1976) studied 106 young, lower class men participating in a methadone maintenance program and found that about one-third were moderately to severely depressed when rated by standard depression rating scales. The depressive symptoms were associated with a decrease in social functioning, an increase in stress, and a history of alcohol abuse. Depression is seen in higher class addicts also, as shown by Hill et al. (1968) in their study of physician addicts.

Exceptions to these are studies by Ling et al. (1973) and Gritz et al. (1975). Ling studied 60 male subjects on a methadone program and rated them by the psychiatric diagnostic categories validated by Feighner et al. (1972). He found that 53 percent had no psychiatric diagnosis other than drug addiction. Thirty percent had antisocial personality disorders, 22 percent had significant drinking problems, and none fulfilled the criteria to be diagnosed as affective disorders, though 10 subjects reported some affective symptoms. Gritz found that methadone patients and abstinent addicts did not have deviations in mood. However, these results differ from those found by most authors.

Many clinicians have observed that addicts often use narcotics to relieve psychiatric symptoms, including depression (Kaufman 1974; Khantzian et al. 1974). Descriptions of narcotic use to relieve depression and other psychic distress are found in psychoanalytic case studies (Hartman 1969) and in literary accounts, such as DeQuincey's *Confessions of an English Opium-Eater*:

> I was necessarily ignorant of the whole art and mystery of opium-taking; and what I took I took under every disadvantage. But I took it, and in an hour, O heavens! what a revulsion! what a resurrection, from its lowest depths of the inner spirit! what an apocalypse of the world within me. That my pains had vanished was now a trifle in my eyes, this negative effect was swallowed up in the immensity of those positive effects which had opened before me, in the abyss of divine enjoyment thus suddenly revealed. Here was a panacea, a *φάρμακου υηπεθ΄ες*, for all human woes, here was the secret of happiness, about which philosophers had disputed for so many ages, at once discovered, happiness might now be bought for a penny, and carried in the waistcoatpocket; portable ecstasies might be had corked up in a pint-bottle; and peace of mind could be sent down by the mail.

Forty-three percent of addicts studied at intake to a methadone maintenance program said they used narcotics to relieve inner tensions and worries.[1] Other studies have found similar results (Fejer and Smart 1972; Hart 1976). Abusers of nonnarcotic drugs have also been observed to use drugs with the intent of relieving depression (Frosch et al. 1967; Rosecrans and Brignet 1972, Burke and Eichberg 1972). Thus, there is substantial clinical evidence that narcotic addiction and depression are related. Depression may occur at some time in almost all addicts, and there may be a subgroup who are constantly depressed, as suggested by Berzins et al. (1974). Reports vary, but most indicate that the depression seen is usually of mild to moderate intensity, except when assessed at intake. Generally, it is not the markedly slowed down and delusional type that is commonly seen on psychiatric inpatient units.

Of course, depression is a common psychiatric problem and it would probably be found in any group of people that one chose to study. Most of the studies done to date make comparisons between depression or suicide levels in addicts and those found in the general population. Most do not compare addicts with carefully matched nonaddicts on criteria such as sex, age, ethnicity, geography, socioeconomic status, education, etc. Those studies which have such controls, however (Frederick et al. 1973; Noble and Barnes 1971; Gilbert and Lombardi 1967) found significant elevations in depression among the addict group.

Changes in Depression Within the Addiction Cycle

Depression appears to be very high at intake and to decrease during treatment. Senay et al. (1976) found that 38 percent of new patients said they felt continuously depressed and that a great number mentioned other depressive symptoms, including 62 percent who were bothered by sadness. Kleber[2] has noted that 80 percent of applicants to a methadone program are clinically depressed, but he finds that this figure drops to about 30 percent after 2 weeks of methadone treatment. Sutker et al. (1974) found that addicts scored lower on depression and on almost every other MMPI scale reflecting ego strength and personal defensiveness after admission to an inpatient unit. Zuckerman et al. (1975) found that virtually all depressive and neurotic patterns noted at intake disappeared during treatment in a therapeutic community. De Leon (1973) found clinical depression in about one-third of applicants to a therapeutic community. Treatment reduced depression and other psychopathology, and the amount of reduction correlated with length of treatment. A short form of the Beck Depression Inventory was used to assess depression in applicants to a methadone program. The level of depression at intake was comparable to that obtained using the same scale on a group of psychiatric patients who had been hospitalized after suicide attempts. A comparison group of ex-addicts and patients who had been stabilized on methadone scored lower, but all groups had higher levels of depression than controls.[3] Similarly, Frederick et al. (1973) found that addicts on methadone maintenance had higher levels of depression than nonaddict controls. He concluded that methadone controlled but did not eliminate depression. Kaufman (1974) studied a sample of addicts who were very disturbed psychiatrically and concluded that methadone acted as an antidepressant for a subgroup that was seriously depressed.

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[1] J. Mintz, A. T. Beck, and C. P. O'Brien, "Some results comparing narcotic addicts, Vietnam veterans and suicide attempters." Unpublished paper 1977.

[2] H. Kleber 1977, personal communication.

Just as methadone treatment alleviates depression, narcotic withdrawal accentuates it. Suicide attempts have been noted to be more common during withdrawal (Jones 1967), as have signs and symptoms of depression (Haertzen and Hooks 1969). This may account for the higher level of depression noted at intake to drug programs. Addicts applying for treatment usually fill out several forms and have laboratory work and a physical examination done on the day of admission. This process takes several hours and many develop mild to moderate withdrawal symptoms. Psychological testing done during this time probably shows higher levels of depression than would be seen 3 to 4 hours after the patient received methadone or that would occur several weeks following detoxification or after treatment in a therapeutic community.

Possible Causes of Depression in Addicts

Parental loss. A high percentage of addicts in public treatment programs come from homes where parents were absent, where poverty was a familiar experience, where a parent was drug dependent, or where physical abuse occurred (Vaillant 1966). Object loss of this kind is likely to increase the chances for later depression. Some have speculated that drugs serve as symbolic replacements for absent parental relationships, especially maternal (Weider and Kaplan 1969; Savitt 1963). The addiction process is probably more complicated than this, but clinical studies have supported the depression-object loss hypothesis by showing that individuals coming from family backgrounds where parental death, separation, or divorce occurred are predisposed to the development of depression, and perhaps to other psychiatric disorders as well (Brown 1966).

Social-environmental. Most addicts in city programs have a record of arrests, and a large number are unemployed. Family relationships, if present, are often conflictual. Friends and acquaintances are often depressed, addicted, drifting, and without clear direction. The patient's physical environment is often dismal and discouraging, with poor housing, dirty streets, and high crime rates. Many see the results of affluence in other parts of society, but feel that their hopes to realize even a part of the "good life" will not be fulfilled. These social and developmental factors can exert a strong influence in tipping the addict's psychological balance toward depression.

Intrapsychic. Intrapsychic conflict is often created by drug dependence. Patients usually have ambivalent feelings about using drugs. On one hand, they are driven by a drug-seeking urge, while at the same time they feel they are doing the wrong thing by using drugs. The entire act of drug-taking can represent passive aggression against parents or other authority figures. These psychodynamic elements often create strong guilt feelings with consequent low self-esteem, sadness or despair, and depression. The actual antisocial and aggressive acts that are a part of narcotic addiction probably increase this guilt.

Continuing drug use also involves a series of decisions. This process may create fears of loss of control within the addict and subsequently produce changes in mood. This cycle has been shown to exist in alcoholics by Alterman et al. (1975), but work of this kind has not been done with narcotic addicts.

Biological. Interestingly, a body of evidence suggests that physiological dependence itself can create or accentuate depression. Wikler (1952) studied one patient closely during an addiction cycle and observed the gradual development of dysphoria. Fraser et al. (1963) studied subjects during a readdiction cycle and found an initial increase in energy and friendliness followed by a gradual decrease in activity with social withdrawal. Martin et al. (1973) observed signs and symptoms of depression in subjects being chronically maintained on methadone. Haertzen and Hooks (1969) observed that symptoms of depression developed in 15 subjects during chronic administration of morphine. Their clinical observations were supported by MMPI testing. All these signs and symptoms were worse immediately before parenteral drug administration and were minimal one-half hour later. They were most striking during sudden withdrawal. Mirin et al. (1976) made similar observations on six detoxified addicts who were experimentally readdicted to morphine. All developed dysphoria with significant increases in anxiety, negativism, and a slight rise in depression. Babor et al. (1976) observed changes in sleep and the development of social withdrawal and dysphoria in 12 subjects during a readdiction cycle. Others have made similar observations in patients during cycles of readdiction to alcohol (McNamee et al. 1968; Mendelson et al. 1968).

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[3] See footnote 1.

These findings suggest that biological alterations accompanying addiction may cause depression. The physiological processes involved are probably very complex and are not completely understood, but alterations in catecholamines and indolamines have been found during addiction and withdrawal. The extent and direction of changes found depends on species, dosage, and mode of administration. Several studies have found that morphine can lower the catecholamine content of certain areas of the brain (Reis et al. 1969; Rethy et al. 1971). This is felt to result from increased activity of norepinephrine containing neurons with release of the amine exceeding the rate of synthesis. However, others have found that morphine increases brain catecholamine levels (Sloan et al. 1963; Meynert and Klingman 1962). They proposed that this occurs by an increased synthesis of catecholamines, a theory also put forth by Jones et al. (1974). Abstinence has been shown by some to result in the return of brain catecholamine levels to normal (Sloan et al. 1963). Others (Meynert and Klingman 1962) have correlated the excitement in the abstinence syndrome with release of brain norepinephrine and with very large decreases in brain and adrenal catecholamines in some species, but not in others. Weil-Malherbe et al. (1965) studied plasma catecholamine and urinary excretion of catecholamines and their metabolites in two male addict volunteers. They found that these compounds increased during addiction and returned to normal or below during withdrawal. Inwang et al. (1976) found that narcotic abstinence is characterized by significantly lower urinary excretion of 2-phenylethylamine. These findings lead one to speculate that the greater incidence of depression during withdrawal could be related to reduced levels of catecholamines at critical brain sites. The biogenic amine theory of depression has not been proven, however, and this theory is not consistent with the changes in vital signs observed in Weil-Malherbre's subjects. These subjects had decreases in pulse, blood pressure, and respiratory rate during addiction, and increases during withdrawal. This suggests that chronic morphine administration leads to a decrease, and withdrawal an increase, in sympathetic reactivity, something that one would not predict from the changes in catecholamine levels.

Alterations in serotonin metabolism may also be related to narcotic addiction. Maynert and Klingman (1962) found no changes in levels of 5-hydroxytryptamine during addiction. However, Shen et al. (1970) showed that there is an increase in the turnover rate of serotonin in morphine-dependent rats and mice, and that depletion of tissue stores of serotonin with reserpine will markedly decrease the analgesic response to morphine in tolerant mice (1969). Way et al. (1968) found that tolerance and physical dependence to morphine in mice can be prevented by concomitant administration of cycloheximide, an inhibitor of protein synthesis. When using p-chlorophenylalanine (PCPA), a compound which inhibits the synthesis of 5-hydroxytryptamine but has little or no effect on catecholamines, they found that tolerance to morphine was markedly reduced but not completely blocked. This suggests that alterations in serotonin metabolism are closely related to narcotic tolerance and addiction.

The recent discovery of endogenous opiates adds an entire new dimension to possible biological bases for a relationship between addiction and depression. Analysis of the physiological significance of these new compounds is in its beginning, but they probably have an effect on mood (Kosterlitz and Hughes 1977; Byck 1976). Chronic administration and (or) withdrawal from narcotics may affect concentrations of these substances with resulting changes in mood.

Clinical Applications

Antidepressant drugs. The antidepressant drugs may be especially useful. They have been shown to be effective and safe when taken in recommended doses, and they can be used without committing therapists to a treatment program requiring large amounts of time. It might be expected that improved control of the addictive process and improved social adjustment or complete remission may result from successful treatment.

Recent studies indicate that this may be the case. Woody et al. (1975) completed and published a double-blind study of antidepressant drug therapy used in conjunction with methadone. They found a significant improvement in depressive symptoms among addicts treated with methadone and the antidepressant doxepin as compared to those treated with methadone plus placebo. The use of amphetamines was also significantly less in the doxepin-treated group. Although this was a short-term study, there was a trend toward a decrease in dropout rate and an overall decrease in street drug abuse in the group treated with the antidepressant. Spensley (1974), in an open study also using doxepin, obtained similar results. Two other studies, one using imipramine and the other using doxepin, are attempting to replicate this work on larger samples.[4]

Other groups are proposing to do similar studies which will also measure tricyclic blood levels. With most drugs, including the tricyclic antidepressants, the amount available for pharmacological action is reflected by the level of drug circulating in plasma. Plasma and tissue concentrations of drug will depend not only on the amount of drug administered (i.e., the dose) but also on its metabolism and excretion. Studies with nortriptyline in nonaddicts have shown great variations within a group of subjects receiving a fixed dose (Asberg 1976). Similar variations have been found for the other tricyclic drugs. Approximately 30 percent of depressed nonaddicts treated with a tricyclic show little or no response. At least a portion of these are not responding because they have an inappropriate plasma concentration of the drug. Plasma levels may be too low (Oliver-Martin et al. 1975; Glassman et al. 1977; Braithwaite et al. 1972) or too high (Whyte et al. 1976).

The concomitant administration of other drugs may also influence the tricyclic levels. For example, these levels are affected by drugs which inhibit or activate the liver enzyme systems that are responsible for the demethylation and hydroxylation of the tricyclics (Goodman and Gilman 1975). Methadone and the tricyclic antidepressants are both demethylated in the liver and are variably bound to plasma proteins. Therefore, methadone may alter the liver biotransformation of tricyclic antidepressants or alter the protein binding and hence the free plasma levels of tricyclic antidepressants. In other words, methadone may enhance or diminish plasma tricyclic antidepressant levels. The study by Woody et al. (1975) mentioned earlier has shown that depressed drug addicts may respond to relatively small doses of antidepressants. Therefore, drug addicts may require less antidepressants than other subgroups. If this is true, it could be of additional practical value in treatment programs. Studies correlating blood levels with clinical response may provide answers in this area.

Of course, any drugs used with addicts must be monitored closely. There have been reports of amitryptyline abuse among addicts in New York City.[5] To the best of our knowledge, amitryptyline is the only tricyclic that has been abused significantly by addicts, but all prescribed drugs must be observed for possible abuse. If abuse should occur with any antidepressant, careful dispensing procedures or liquid preparations mixed with methadone should greatly reduce or eliminate the problem.

Psychotherapy. Some evidence indicates that cognitive-behavioral therapy is useful in the treatment of depressed addicts[6] and for nonaddicts with depressive illnesses (Rush et al. 1977). This is a form of therapy developed by Beck that is centered around correcting certain aberrations in thinking and behavior. It teaches psychological skills including integrating, labeling, and interpreting experience correctly. It attempts to alter excessive or inappropriate emotional reactions and behaviors by changing faulty conceptions and self-signals. Beck (1977), in his treatment manual, and others[7] have described some of the cognitive distortions found in addicts. This is a very active therapy and may be especially useful for heroin addicts.

The general psychiatric literature as well as clinical experience indicates that many depressive illnesses respond to analytically oriented psychotherapy. Relief of guilt feelings, tension reduction, better impulse control, and improved interpersonal relations are some of the areas that analytically oriented therapy can address effectively. The attention and training that analytic education places on countertransference phenomena may be especially useful. Addicts frequently make therapists feel sorry for them or become discouraged and angry. There is a danger that therapists will express these feels verbally, attitudinally, or via instituting punitive or overly permissive program policies. Therapy is seriously impaired when this happens, as described by Davidson (1977). Analytically trained therapists are well prepared to relate to the addict's demanding, impulsive, and self-destructive behavior in a calm, interested, and consistent way. This kind of approach can be very useful in establishing a helpful relationship with the patient and can provide a good foundation for effective therapy.

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[4] J. Blaine 1977, personal communication.

[5] B. Stimmel, oral presentation at the annual meeting of the New York Academy of Sciences, Washington, D.C., November 1977.

[6] B. F. Shaw, R. A. Steer, and A. T. Beck, "Treatment of drug and alcohol abuse with cognitive behavioral therapy." Unpublished paper 1977.

[7] B. F. Shaw, R. A. Steer, and A. T. Beck, "Structure of depression in heroin addicts: a factor analytic study." Unpublished paper 1977.

Two projects have been started recently that will study the effectiveness of cognitive-behavioral and analytically oriented psychotherapy for addicts. If these studies show that significant advantages result from using these psychotherapeutic techniques, they could have an impact on the treatments offered by drug programs. Psychiatric diagnostic evaluations also will be done as part of these studies, with special attention given to evaluation of depression.

Social counseling. Counseling, as described by Wolberg (1967), may also treat depression effectively. Addicts become involved in many life crises, such as loss of jobs, legal problems, family arguments, and medical illnesses. Rapid intervention in these situations by a therapist who is familiar with both medical and psychiatric illness as well as social agency resources may be helpful. Addicts will sometimes respond very positively if they can obtain and hold a job, if they do well in an educational program, if they can learn to get along better with family and peers, if they can get favorable treatment within the legal system, or get relief from a medical problem. Timely management by a therapist who can assess the patients's medical-social problems and make appropriate referrals can be very useful.

CONCLUSIONS

Many studies and clinical reports indicate that depression is often found in narcotic addicts. The amount observed varies with the population tested and the time in the addiction cycle that the testing is done. Several studies of lower socioeconomic patients who are being maintained on methadone indicate that about 30 percent are clinically depressed. This figure is higher if depression is assessed at intake to the program, before the patient is stabilized on methadone. Most studies do not compare addicts with carefully matched nonaddict controls; however, those which have used such controls find significant elevations in depression among the addict group.

Clinicians have theorized that depression may propel some into addiction. Others may become addicted through circumstances that would lead them to become depressed if they did not become addicts. In this latter case, narcotics can protect against depression. Depression may also contribute to the maintenance of illicit drug use and to relapse after detoxification. There is some evidence that the long-term consequences of addiction may create or increase already existing depression. This can occur by the development of medical, intrapsychic, interpersonal, legal, and vocational complications. Depression may be biologically induced via changes produced by narcotics in neurotransmitter concentrations at critical brain areas.

If any of these proposals are true, one would predict that successful treatment of depressions would decrease narcotic use and improve chances for remission in some patients. Few studies have been done in this area, thus there is no final answer to this question at present, although there are data to suggest that antidepressant drugs may be helpful. The possible treatments for depression in addicts reflect its multiple origins: interpersonal-intrapsychic (psychotherapy); socio-medical (socio-medical referral and services); and biological (pharmacological therapies). Any of these treatments, if effective, may lead to advances not only in the treatment of addiction and an increased understanding of its causes, but in other areas of psychiatry as well.

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27. Drug Abuse and Drug Programs in Rural America

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We know comparatively little about drug abuse in rural America. Data on incidence, cause, context, and program effectiveness are scarce, and are not accumulating at a satisfactory rate. The reasons for this are historical, and are probably tied to the funding priorities of those Federal and State agencies charged with the investigation of drug abuse, e.g., the National Institute on Drug Abuse (NIDA) and those primarily concerned with rural people, e.g., the U.S. Department of Agriculture (USDA). Until very recently, the tendency among Federal and State funding agencies was "to deflate the incidence of drug use in less urbanized areas, . . .to indicate that drug use is more of a big city phenomenon" (Nyberg and Staggs 1976, p. 14). Thus, not only was baseline research not encouraged, but funding matrices and treatment criteria were "based on the urban treatment experience" (National Institute on Drug Abuse 1977, p. 1). Agencies substantively concerned with drugs were not particularly interested in rural populations, and those organizations concerned with rural populations were not interested in drug-related research.

Recent activities[1] indicate a change in this state of affairs. Based on current information, this paper will discuss briefly the extent of rural drug abuse, the character of rural drug abuse programing, and implications for further research, treatment, and prevention. It is important to note, however, that these remarks are limited by current knowledge, which is not supported by rigorous or extensive research. Substantive comments are suggestive, and the research cited is necessarily exploratory.

THE EXTENT OF RURAL DRUG ABUSE

No single, comprehensive data set exists which describes the extent or character of drug use in rural America. This is not to say that there are no relevant data in the area—just that the available information is insufficient.

Basically, research activity can be categorized into five major forms:

(1) State and local research, where drug abuse data are confined to a specific State or region, or rural community within a State (Blackford 1974, 1975a, 1975b; Boyink et al. 1974; Carman 1974; Nyberg and Staggs 1976; Stroman 1972; Tolone and Dermott 1975).

(2) Incidental survey data, where some information on drug abuse was included in a broad survey primarily concerned with other issues or where the "rural" measure is reflected in some inexact proxy, e.g., nonmetropolitan (Abelson and Fishburne 1976; Babst 1972; Gold and Reiner 1973; Johnston 1973; O'Donnell et al. 1976).[2]

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[1] Here one notes the formation of the Association for Rural Mental Health, the recent Rural Mental Health Work Group of the National Institute of Mental Health (NIMH), and several studies funded by the National Institute on Drug Abuse (NIDA) of direct relevance to rural America.

[2] The second largest set of data is most probably lodged in these incidental surveys. In some cases, the question of drug use was not a primary concern of the study and hence the data are not particularly well focused (Gold and Reiner 1973), or drug data was added in the final year of a longitudinal design (Johnston 1973), or—most likely—rurality itself was not a major concern and hence the data are framed by undesirable proxies, e.g., nonmetropolitan (Abelson and Fishburne 1976; O'Donnell et al. 1976). In all of these studies, sampling procedures—even though the populations are large and often national in scope—seriously restrict their viability. In a few cases, the sampling is so restricted that it can only refer to 10th grade boys (Johnston 1973) or other such reduced spheres.

(3) Specific subpopulation comparisons which are, essentially, State and local research efforts with an explicit and primary concern for racial and/or ethnic differences (Cockerham 1977; Cockerham et al. 1976; Guinn and Hurvey 1974, 1976; Landis et al. 1975; Guinn 1975, in press).

(4) Patient-Client data (Brown 1978; NIDA 1977) which are largely compiled from the Client Oriented Data Acquisition Process (CODAP) forms required of all enrollees in federally funded treatment programs.

(5) Non-American data sets (Hays 1972; Smart et al. 1972; Webb and Collette 1977) where rural drug data have been gathered in countries other than our own.

Obviously, with work so fundamentally dissimilar, any effort to paint a general picture of rural drug abuse would be risky and deserving of caution. This is particularly so since no single finding is consistently supported by all of the literature previously cited. However, certain findings do appear more well established than others.

In general, the ". . . rural abuser is comparatively young" (NIDA 1977, p. 20), less inclined to wide-ranging opiate experimentation and addiction, and—depending upon the specific data cited—either more (NIDA 1977) or less (Nyberg and Staggs 1976) likely to extensively mix the substances consumed (polydrug use). Indeed, most research to date appears to indicate numerous differences between rural and urban drug users.

- With the single exception of black females' use of barbiturates and hallucinogens (Nyberg and Staggs 1976, 1977), the urban adolescent almost invariably reports greater use of drugs than does the rural adolescent (O'Donnell et al. 1976; Stroman 1972).
- This is particularly true for Mexican-American youth (Guinn and Hurley 1976).
- Moreover, rural adolescent drug users are much more likely to hoard their drugs and not to share them with others than are urban adolescents (Nyberg and Staggs 1975).
- Furthermore, there is a strong possibility that the variation of incidence and frequency with age is curvilinear, i.e., that use peaks in the 11th grade and then declines for rural youth (Guinn 1975; O'Donnell 1976).
- The data gathered by Webb and Collette (1977) would not support this, and in referring to adults they note that "clearly both men and women in rural areas receive a far larger number of drugs per capita than do persons in urban areas." (This study dealt only with prescribed tranquilizers and hypnotics in New Zealand.)
- Finally, some evidence (Nyberg and Staggs 1977) suggests that the subcultures which typically develop around adolescent drug use differ in composition and character; that rural adolescent drug-based subcultures are significantly different from similar urban phenomena, particularly with regard to consequent delinquent activity.[3] In this regard, the data suggest—most surprisingly—that rural girls are much more likely to develop an intense subcultural commitment than are rural males or urban females.

Whatever the differences and similarities, fragmented data demonstrate that drug use and abuse are not confined only to urban and suburban America. Rural people, particularly the rural young, also consume dangerous and illicit substances, and much of what we currently know indicates that the programs developed to respond to this problem are currently inadequate (NIDA 1977; Nyberg and Roebeck 1975), if present at all.

RURAL DRUG ABUSE PROGRAMING

Whereas less than 60 percent of urban admissions receive "drug free" treatment, virtually all (98.3 percent) rural clients receive such treatment (NIDA 1977). Rural admissions require hardly any detoxification or maintenance. In large measure this is due to the simple fact that almost two-thirds of all urban admissions report their primary drug as being an opiate, as compared to only 8 percent of rural clients (Brown et al. 1977). For rural admissions, the primary drug is typically marihuana (31 percent) or a barbiturate (32 percent). Clearly, rural programs appear to deal with a different type of clientele.

Even when the primary drug at admission is the same, major differences in clientele are manifest:

> The finding that rural . . . opiate abusers are more likely to report using a large number of substances, together with the . . . extensive use of mental health services, may suggest . . . greater psychopathology or disturbance than their urban counterparts.
>
> —NIDA 1977

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[3] Here data (Nyberg and Staggs 1976) suggest that drug use significantly correlates with delinquent activity (e.g., fighting, car theft, vandalism, etc.) for rural females and urban males, but not for their counterparts. This is but one more example of the research anomalies present in the study of rural adolescent drug abuse.

It has long been suspected that the structure of rural life is more closely tied to primary socializing agents than is urban or suburban life. The role that this more intimate social order plays in facilitating or disrupting service delivery—not to mention drug use per se—has not yet been seriously considered, but community participation in programs—particularly in rural areas—appears essential. As Libertoff et al. (1977, p. 2) note, "communities must be integrally involved in the development, staffing, and running of these locally based services [sic] to succeed." The problem, of course, is that the very dispersal of communities which defines an area as rural also necessitates a multiplicity of programs. And this greater number of programs significantly increases per client costs over comparable urban matrices. The meaning of all this, of course, is hardly clear. We note that rural drug abuse is in some ways similar to, and yet decidedly different from, urban drug abuse; that the rural drug abuser is considerably less likely to manifest "addictive" symptoms, and yet more likely to evidence "greater psychopathology or disturbance"; that fewer clients are treated by rural programs, and yet the cost of those programs is consistently greater, and so on. The remainder of this chapter will discuss the implications of these and other anomalies for research and programing.

FUTURE RESEARCH

Given the fragmented character and often contradictory findings of current rural drug abuse data, the most urgently needed research is that which would provide baseline data for rural America, i.e., a national survey of rural drug abuse. In this regard, the advantages of a representative, national data set are obvious. Presuming the sample included major racial, socioeconomic, social-structural (e.g., age, sex, religious differentiation) and "community type" differences, a data set not acutely subject to the vagaries of location would be available. Given that much of the current information demonstrates diverse findings, a national survey might make a major contribution in resolving or refocusing these research anomalies. Moreover, since one suspects that such a survey would require a network of researchers,[4] an attendant consequence of the research would be the formation and training of a group of researchers with a substantive interest in rural drug use and abuse. As much as by anything else, current knowledge and effort are seriously impaired by a lack of such people.

Such a national survey, however, would not provide all the information that is needed, or even ask all the appropriate questions. In this regard, three additional research areas appear deserving of attention: (1) informal treatment alternatives, (2) the socializing function of the rural school, and (3) the structure and development of rural drug-based subcultures.

The first of these, informal treatment alternatives, presents the most obvious tie of research to programing and begins with the initial hypothesis that rural people are more closely integrated with traditional sources of institutional support than are urban residents. If this is the case, and if the particulars of such support warrant generalization across diverse rural communities, then it might prove feasible to build into current resources (e.g., clergy, law enforcement officials, medical personnel, educators, community business leaders, etc.) certain competencies for prevention and/or treatment. Such research would speak directly to documented difficulties in the logistics and economics of rural service delivery.

The second research program, the rural school, recognizes the particularly important role that rural educational institutions play in the socialization of rural youth. Virtually all studies confirm the fact that drug abuse is "age-graded"; that use increases as the adolescent moves through his/her educational career. However, as already noted, current data suggest that this process lessens—and perhaps reverses itself—when the rural adolescent reaches his/her senior year. Unfortunately, there simply are no current data on the structure or process of rural educational systems, particularly that peculiarly rural phenomenon—the "single campus" school, i.e., grades K-12. What appears needed are ethnographies or "natural histories" of these rural schools.

Finally, some existing data (Nyberg and Staggs 1977) suggest that the character and composition of rural, drug-based subcultures differ significantly from their urban counterparts, particularly with regard to females; the rural adolescent female appears much more "committed" to the subculture than is either the rural male or urban female. Perhaps this issue can be integrated into the former, thus expanding the critical focus of the suggested ethnography. In any event, both contextual and functional descriptions would significantly augment the survey data proposed earlier.

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[4] This seems the only viable approach, since rural America is so dispersed and the issues are so sensitive. The former would preclude a single, nonlocalized approach if for no other reason than sampling vagaries. The latter would preclude telephone interviews since the young would no doubt be responding while in the presence of family.

FUTURE PROGRAMING

A reasonable hypothesis, prevalent in a wide body of literature, is that the social milieu of rural people is substantively and orientationally different from the urban milieu. Hence, values and norms are different. This being the case, it is not unreasonable to expect that differing programs are required. In this regard, the already noted "competency enhancement" of informal treatment and counseling persons must be considered a distinct option, as would more explicit efforts at "family intervention" (NIDA 1977). Here we are merely extending assumptions based on more broadly considered "mental health" programing to "drug abuse" programing.

Indeed, the entire "deinstitutionalization"[5] model (Bachrach 1977a; Bischoff 1976; Gertz et al. 1975; Mazer 1976; Riggs and Kugel 1976) appears instructive, provided that one notes that much of it is conjective and almost all of it is poorly tested via rural drug abuse programing. More evaluation and experimental research seem called for, even though the model appears generalizable to problems of rural drug programing.

One form of deinstitutionalization is the extension of satellite clinics into rural catchment areas.[6] Currently employed in only a few States, the satellite seems the next best choice to competency enhancement in terms of meeting the major logistical problems involved in service delivery to rural people. However, satellites present problems as well as solve them, particularly with regard to staff-client relationships:

> The single most important asset for . . . programs in rural communities lies in the personnel who choose to practice in these areas and their grasp of the essentials of effective . . . care.
>
> —Bachrach 1977b

Hence, a major effort seems necessary in the training of professionals who will ultimately provide service in these rural communities. There is no particular reason to presume that a currently trained professional—no matter how generally competent—will be effective in a rural setting, especially since most of his/her educational and practicum experiences will be urban-based. Consequently, it would appear that a major priority for future programing must include a serious consideration of the training requirements and experiences necessary for effective service delivery (e.g., educative, preventive, and treatment) in rural communities. Particular sensitivities and interpersonal skills seem called for, and the determination of these qualities (and subsequent education in them) seems essential if rural personnel are to be effective. This should be a major concern in terms of future programing, and the long-term experiences of the U.S. Department of Agriculture's Extension Service and recent rural mental health literature (Bachrach 1977a; Riggs and Kugel 1976) should prove instructive. What appears necessary is the presence of programs and personnel who can effectively operate in an environment where the distinctions between education, prevention, and treatment are inappropriate (NIDA 1977).

Generally speaking, those programs which have been most successful are those which can accomplish the following tasks:

(1) gain the support and cooperation of community leaders, while

(2) also earning the trust and receptiveness of the client, and

(3) do both while not antagonizing, frightening, or threatening the community's citizenry or existing social order.

These tasks almost invariably require several staff people with various but complementary skills, and some administrative scheme which effectively organizes their talents so that their individual efforts do not become counterproductive. In this regard, several programs currently in operation have found useful a formal relationship with the local Community Mental Health Center (CMHC) or some other facility which serves as an organizational umbrella.

Perhaps more instructive than anything else is the identification of problems by existing rural drug abuse programs. The four most often cited "major problems" are—in order—(1) lack of acceptance from the general community, (2) lack of acceptance from community agencies, (3) insufficient funding, and (4) lack of staff experience.[7] Cognizance of these typical pitfalls, plus a particular sensitivity to the individuality of each rural community, will likely prove most useful in the design of future rural drug programs and services.

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[5] Though oversimplified, "deinstitutionalization" refers to the modal treatment of clients as outpatients, i.e., not in institutional residence. When applied to most current mental health and drug abuse programs, the model is so deinstitutionalized that it becomes, for all practical purposes, an outreach program.

[6] Though there are several variations of satellite programs, the typical model employs a storefront operation in several towns which geographically surround the community where the principal program is located. These satellites are then staffed, on a part-time basis, by personnel who travel from the primary program to these ancillary and/or secondary service facilities. Generally speaking, the more often these satellites are staffed and operating, the more successful the program. Full-time staffing is most beneficial, though it is very costly.

Finally, and most briefly, some readjustment in the currently operational Federal funding matrix seems warranted, at least until programs can be designed and instituted which explicitly respond to the needs of rural America. Perhaps some form of baseline allocation plus specific client cost-matches would be appropriate, though this requires far greater attention than is appropriate here.

CONCLUSION

These few remarks cannot fully represent the problems or the paradoxes involved with rural drug abuse. Clearly, the need for better, more representative data exists. When one set of data indicates the rural drug user is polydrug involved, and another that s/he is not; when the few studies we have are either intensely localized or confined only to treatment clientele; when existing programs are not just inadequate, but possibly inappropriate as well, then the need for extensive work is truly serious. It becomes urgent when one notes the recent trends in rural immigration (Cosby and Howard 1976), and crucial when we imagine the consequences of our continued neglect. Until this work begins in earnest, research, programing, and—most importantly—rural people, will continue to suffer.

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[7] Here, and elsewhere, this chapter has profited greatly from an as yet untitled and unpublished report forthcoming from the National Institute on Drug Abuse (NIDA). Coordinated by Dr. Rebecca Sager Ashery, the report notes (among many other things) that the most common types of services found among rural drug programs are (1) individual, outpatient counseling, (2) community presentations and workshops, (3) family counseling, (4) criminal justice diversion, (5) alternatives to drug abuse, and (6) inservice teacher training. Perhaps most important, however, is the extent to which rural programs succeed in transforming environmental limitations into assets, particularly with regard to the utilization of existing structural and personnel resources, e.g., strong sense of community, close socializing ties to churches and schools, ready use of volunteer workers, etc.

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28. The Drug Abuse Industry and the "Minority" Communities: Time for Change

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BACKGROUND

This paper will attempt to place the issue of "minorities" and drug abuse in a clearer perspective than has heretofore been available.

We will lay out, in a cause-and-effect manner, the reasons why minorities can make a strong case for a total revamping of the drug-abuse establishment—from national policy formulation to research goals and objectives to treatment and prevention strategies and approaches.

We believe the facts support the following set of assumptions

- That hard-opiate abuse has been, and continues to be, primarily a minority youth problem.
- That drug laws have been traditionally repressive, racist in nature, and are applied primarily as another social-control mechanism aimed at minority groups.
- That, in spite of the above, the field has been traditionally controlled by the dominant society, applying the medical model to what is essentially a social problem.
- That, because of the above, the Federal and State response (policies, priorities) has been inadequate to meet the needs of those most affected by the problem.
- And that, because of all of the above, minorities have organized along ethnic and racial lines to try to impact on National and State policies.
- Finally, some conclusions and recommendations, as well as some implications affecting research, treatment, and prevention efforts, are offered.

HARD OPIATE ABUSE AS A "MINORITY" PROBLEM

The quotes around the word "minority" simply indicate a misnomer. For in this field we can easily show, using CODAP and DAWN data, that minorities constitute a disproportionate majority of hard-opiate abusers.

CODAP data for the first half of 1976, as well as for all of 1975, indicate that somewhat more than half of the reported drug abusers came from minority groups. Further, and more to the point, 63 percent of all heroin abusers were from minority communities. This situation is nothing new. Essentially the same has held true for at least 30 years, since large numbers of minority youth began serious opiate abuse in the late forties (Espada 1977). Further, this is supported, after some adjustments, by both the CODAP and DAWN systems, which yield identical results with different data sources. The third major national data system—Texas Christian University's Institute of Behavioral Research—indicates that heroin-user admissions to drug treatment in 1969-73 were 74 percent nonwhite. However, and more importantly, it is clear to this writer that there is a sharply qualitative difference in opiate abuse in the minority communities. Opiate abuse affecting one-half of 1 percent of the white adult male population may be (and often is) viewed as a harassment, a loss, a significant form of deviancy. However when a similar problem affects, say 5 percent of the young adult males in the minority communities, another situation develops. Involvement with or addiction to opiates then becomes a significant way of life, pervading a community; a competing and often destructive lifestyle. It becomes a condition the community lives with at all times, rather than an event affecting others or galvanizing people into action.

Further, the drug-use situation is confused and exacerbated by the cultural context in which drugs are meshed. In recent years two factors seem to have been especially important in the perceived increase in drug abuse in minority communities. First, unemployment, especially among older teenagers and young adults, has soared in these areas and shows no signs of abating. In the South Bronx, for example, unemployment among young males is presently (April 1978) estimated at well over 50 percent. Second, with the vast increase in drug-control programs, especially law enforcement, the serious consequences of drug use have soared. Increases in arrests and convictions have multiplied the numbers of young minority people carrying the adverse stigma of being ex-junkies and ex-convicts. The implications are that the adverse results of drug use are greater even if the number of drug users remains stable.

Finally, we can only conclude that the evidence points clearly to the fact that, because of the magnitude of the difference in drug use and because of the infinitely more severe consequences of drug abuse between the dominant society and the minority communities, drugs must be considered from totally different perspectives. Once this premise is accepted, it is then clear that entirely different approaches to the problem are necessary.

DRUG LAWS AS REPRESSIVE TO MINORITY COMMUNITIES

> Return to class we must, where public policy is the stratagem of class conflict and law enforcement the weapon, as sharp as the exclusion campaigns against Chinese and Mexicans, or the repression of ghetto blacks. . . Not science but mythology potentiates this history and the social forces whose movements it records. If the monkey on the man's back were only the drug, he would still be a free man.
>
> —Helmer 1975

We further agree with the position, so well stated by Helmer, that:

> Narcotics use in America has always, both before and after the Harrison Act, been predominantly a working-class phenomenon. This has been a specific cause, not a general consequence, of narcotics prohibition.

The historical connection between repressive drug laws and racist American attitudes has been well documented (Musto 1973; Bonnie and Whitehead 1974). The point here is to place this all too obvious fact as a backdrop to the present situation, particularly Nixon's insidious war on the junkie as a political enemy. This racist-inspired, politically motivated conspiracy was an integral part of the Nixon-Agnew crusade against crime in the streets, and a natural consequence of more than 60 years of public policies which were based on bigotry, fear, and worse, the ascendancy of the medical control in "the sale and supply of all medical services, including drugs." Add to this the "expansion of police powers, under political authority, to coerce all aspects of working-class behavior, including drug consumption," and you have a most efficient social-control combination.

Consider, as evidence, the following facts about the disproportionate impact of repressive drug laws on minorities:

- Arrests on heroin charges show an even higher proportion of minorities than the treatment statistics (CODAP, DAWN, DARP). A 1971 study of opiate arrests in six major cities showed 81 percent nonwhites; the Drug Enforcement Administration's listing of active narcotic users indicates 55 percent blacks; however, this latter figure does not include other minorities, which we estimate at about 25 percent.
- Penalties for opiate possession and sale are severe and have not been eased as have marihuana penalties, which have fallen dramatically.
- "The difference in race distribution . . . grows more radical as we descend into more local and specific treatment data," report Gibson and Hunt (1977). Citing a Johns Hopkins University study, they note that minorities comprise 66 percent of those on methadone maintenance, but well under 50 percent in other treatment modalities. The repression of minorities appears to be chemically as well as legally based.
- There is strong reason to believe that minorities are disproportionately represented in the prison population for drug charges and that the proportion of minorities is even greater than for arrests.

Item. In New York State, in 1974 and 1975, 71 percent of those admitted on drug charges to State prisons were black or Puerto Rican.[1]

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[1] New York State Department of Correctional Services, Division of Program Planning, Evaluation, and Research. Characteristics of New Commitments, 1974 and 1975. Albany, N.Y.

Item: A survey of inmates in State prisons indicates that of 18,807 inmates serving drug sentences, 40 percent were black, 15 percent were Hispanic, and 1 percent were other nonwhite. Of those with only heroin charges, 54 percent were black (no Hispanic breakdown was given).[2]

THE DOMINANT SOCIETY HAS TRADITIONALLY AND PERVASIVELY CONTROLLED THE DRUG-ABUSE FIELD

There has never been, since the passage of the Harrison Act in 1914, a member of any minority group in any position of leadership in the field of drug-abuse control, treatment, or prevention. This statement carries right through to this day, under an administration proclaiming human rights as a priority across the world. The top six policymakers at the National Institute on Drug Abuse, as well as the so-called "principals," Dogoloff (ODAP), Besteman (NIDA), Bensinger (DEA), Falco (State), the entire staff of the recently phased out Office of Drug Abuse Policy, and over 90 percent of the top three staff in all of the single state agencies, are from the dominant society.[3]

This in spite of the fact that there are, at this point, several individuals from minority communities with excellent credentials, something which was always denied in the past: "If only we could find qualified individuals. . ."

Further, we find that the medical profession is still in firm control, espousing a medical approach to the problem and generally relegating the social causes of drug abuse to a distant second.

THE EXCLUSION OF MINORITIES AND THE RESULTING LACK OF RESPONSE TO MINORITY NEEDS

A recent prevention policy position paper from the Office of Drug Abuse Policy serves as an excellent example of how lack of significant minority input can lead to national policies which miss the mark.[4] Although admitting that "persons will not use drugs destructively . . . if they feel good about themselves and what they are doing, if they think regular intoxication will interfere with their life objectives, and if they find their 'straight' life more meaningful than their 'stoned' experiences," they go on to enunciate four "general goals" which are so middle class in conception and expression that they have no relationship at all to the minority communities.

They wax ideally of "enhancing personal experience. . . highlighting the ability to live meaningfully and constructively without drug dependence." Which brings to mind a close friend who was attempting to do just that, in East Harlem—a poet, a painter, a photographer, an intelligent, wise, and gentle 24-year-old, who, for no good reason fell into the hands of the police and was said to have hanged himself with his hands cuffed behind his back. A grand jury exonerated the guilty. They go on to say, in this white paper, that "enhancing family experience" is a desirable goal — "a secure, loving and communicative interaction among parents and children; increasing parental effectiveness, adult-role modeling and family concern." Go tell that to a 30-year-old black woman in Harlem, with six children and no man in the house, living on the edge of disaster daily, with no hope of ever breaking out of the vicious cycle of poverty.

There is more: "enhancing institutional experience" is another laudable goal—"enhancing the climate of both the school and the neighborhood to offer excitement in learning, hope in vocation, and opportunity for growth and success in the adult world." I offer as further evidence of the distance between the framers of this document and the realities of life in the ghetto the shocking disintegration of the educational system as well as the physical and moral deterioration of those places euphemistically termed the "inner cities." But the absolute understatement of the year comes right on the heels of this trumpeting to higher middle class values: "There is reason to believe" (careful, now) "that deficiencies in these four areas" (the goals stated) "are correlated with potential drug abuse." Whew! The fact is that they are directly related, and that this kind of weak-knee-jerk, half admission of the real causes probably does more harm than good.

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[2] Quoted from "Survey of Inmates in State Correctional Facilities," conducted by the Bureau of the Census for LEAA 1974, in a personal communication to the National Association of Puerto Rican Drug Abuse Programs from the Crime Analysis Section, June 14, 1968.

[3] Creative Socio-Medics, An Assessment of the Statewide Services Contract System and Minority Needs. Final report to the National Institute on Drug Abuse (contract no. 271-77-12(5)) April, 1978.

[4] Office of Drug Abuse Policy, "Prevention Policy Position Paper" undated and incorporated, in large substance, in Drug Use Patterns, Consequences and the Federal Response, 1978. (See References.)

This paper is full of examples which can only be labeled "well meaning but misdirected." As a final sop, they devote exactly one-half page to "special populations," where they acknowledge that

> drug abuse is often more severe among subcultural and ethnic groups, especially those with more limited economic and social resources.

Yes, it is: Puerto Ricans run a factor of 10 times higher risk of becoming addicted than whites; blacks run an 8 times factor.[5] This lack of sensitivity, this timidity at facing facts, this obviously colorblind position paper was to a great degree the product of an ODAP conference attended by approximately 20 experts in the prevention field. This writer was in attendance, invited at the last moment, and after much pulling and tugging, obtained general agreement that the issues were so different in the minority communities that a totally different approach to prevention was essential. The efforts, obviously, were in vain.

ODAP's policy review, a product of a demand reduction task force, entitled "Drug Use Patterns, Consequences and the Federal Response," (1978) admits that "in general it was apparent that little definitive information exists regarding use, misuse, and abuse of drugs by these special population groups." (pp. 35, 36). And on the 3½ pages devoted to "ethnic minorities" (out of a total volume of 130 pages) they further admit that

> an assessment of the drug abuse problem in ethnic minority communities is a complex and difficult task. One contributing problem has been the lack of research information and data to clarify the nature of the drug problem in the minority communities.

This is followed by a statement which closely matches the one quoted above (from the prevention paper) for just plain jelly: "This has somewhat hampered management efforts to make drug abuse programs and resources of the Federal Government available, accessible, sensitive, and relevant to minority community concerns." (!!!) They proceed from there with gay abandon, quoting a meaningless profusion of disconnected data, probably to indicate some awareness of the facts (pp. 44-47). And yet, in spite of the admission of a lack of ethnic minority data, not one word is mentioned under the research section regarding this unmet need. Instead, NIDA is lauded for its past efforts:

> Among the most important findings of NIDA sponsored research to date have been: the discovery of opiate receptor-sites in the brain, the development of narcotic antagonists, testing of animal models detecting abuse potential of drugs in humans, development of analytical methods to find drugs in biological specimens, the study of the major psychoactive ingredient in marihuana, the voluntary drug-dependence remission of the addicted Vietnam veteran and the discovery of new narcotic maintenance therapies.

It suddenly becomes crystal clear why there is such a lack of socially oriented, cause-driven research which could provide some light on drug abuse in the ethnic minority communities.

Another $38 million is slated to be spent this coming year, with no commitment to any effort in this regard.

In a speech delivered at the national drug abuse conference in San Francisco in 1977 this writer concluded:

> We, in effect, have no choice but to believe that the basic assumptions upon which policies are formulated were inaccurate, producing policies which were off the mark and priorities which were topsy-turvy. So, after all is said we are left with the hard fact that we, who have always borne the brunt of the problem, continue to suffer, even to a greater degree, the crippling consequences of the mis-use of drugs.

THE STATEWIDE SERVICES CONTRACT SYSTEMS, THE STATE DRUG ABUSE AUTHORITIES, AND MINORITY PROGRAMS

A recent study commissioned by NIDA[6] documented a number of problems and inequities encountered by minority treatment programs at the State and local levels. Generally, it boils down to, at best, lack of sensitivity to minority needs from a structure that is overwhelmingly white (over 90 percent of the State directors are from the dominant society). In spite of all of this, the HEW civil rights regional offices (10 of them) have been regularly signing off on all States as being in compliance with all laws, rules, and regulations concerning civil rights and affirmative-action requirements. Somewhere, someone is lying. Further, most minority programs are small, with the problems inherent in all small programs. Among these were:

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[5] Creative Socio-Medics, The Nature of the Drug Abuse Problem for Asian Americans, Native Americans, and Puerto Ricans. For the National Institute on Drug Abuse (contract no. ADM 271-76-4415). 1977.

[6] See footnote 3.

> delays in reimbursement for service providers; burdensome paperwork requirements; inadequate access to policy makers resulting in unresponsive decisions about the nature and extent of services provided to segments of the abuser population; insufficent technical assistance; and an overemphasis on program management reviews.

Further, these programs are "unlikely to receive special funding considerations from private groups or to develop an internal fundraising capability." A good reason for this failure is the abysmal lack of data. "Treatment programs pressed to meet daily operational costs cannot allocate funds to perform or purchase incidence/prevalence surveys or other research designed to assess needs . . . Insufficient data about the drug abuse problem within their specific group, then, hamper efforts to seek continued funds, add innovative services, or promote interest in ethnic minority-specific problems." The differences between majority and minority programs were many:

> Majority programs appeared to be more effective at obtaining third-party reimbursements and in including third-party money in their program accounting to maximize budgetary flexibility. By contrast, ethnic minority programs were frustrated in their attempts to secure third-party money (again, the administrative, paperwork burden was mentioned) and, when secured in handling these dollars in program accounting. One program had stopped pursuing third-party reimbursements because the work involved was not leading to any programmatic benefits.

Other important operational differences included the ability of majority programs to manipulate the financial world (the use of overdrafts and low-interest loans) and the use of specialists, while ethnic minority programs attempt to get along as best they could with "untrained generalists." Majority programs had few difficulties recruiting staff, where minority programs had severe problems in that regard. Staff turnover was "a problem."

In the face of these and a myriad of other problems besetting the small minority treatment programs, the logical response from the States would be one of assistance, first in identifying, through the State-plan process, the minority needs (by conducting a needs assessment), then by either enriching or supporting these programs (by providing ample technical assistance) or by starting new ones where needed. The facts, as documented in this study, are that there was no specific minority input in 75 percent of the State plans. And, "while more than three-fourths of the States presented indicator data broken down by race ethnicity, only half (55 percent) of the States specified ethnic minority group needs in the needs-assessment section of the Plan." Lastly, less than half the States established goals and objectives for ethnic minorities.

THE ETHNIC MINORITY RESPONSE

In response to the continuing critical needs and concerns expressed here and elsewhere, the National Coalition of Ethnic Drug Abuse Associations (NCEDAA) was organized in May 1977 at the National Drug Abuse Conference in San Francisco. In their letter to Dr. Peter Bourne, former director of ODAP, announcing the formation of the group and requesting a meeting, they stated the primary reason for the action: "An analysis of some of the most glaring failures exposes a common denominator: the exclusion of our representatives from the policy formulation and implementation process. This has resulted in an insensitivity and lack of understanding of the needs which hamper our efforts to deal with the problem." In subsequent meetings since then the organization has agreed on the major purposes and goals:

- To impact upon the national drug abuse policy structure;
- To define issues from a minority perspective;
- To identify problems hindering effective delivery of services to minority and other underserved communities;
- To offer new approaches toward solution of the problem.

The major thrust, however, was emphasized in a letter to Peter Bourne in which a forthcoming meeting's agenda was discussed: ". . .it has become quite clear to us that there is one overriding issue that is of such importance that we feel it must be resolved before we can address any others. We refer to the question of how we, the representatives of the most affected communities, can penetrate the policymaking/implementation process which has been closed to us in the past."[7]

In effect, then, the Coalition Steering Committee (see list at end of chapter) as well as a number of others, considers the issue of representation at the national level of such importance that it stands far above all the others.

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[7] Frank Espada letter to Dr. Peter Bourne on behalf of the National Coalition of Ethnic Drug Abuse Associations, July 1, 1977.

Since July 1977, the coalition met in Washington, D.C. with Dr. Peter Bourne and ODAP on four occasions and, although a number of issues were discussed, no clearly discernible pattern has emerged which can predict how minority input can be formalized. In the first meeting, held at the Theodore Roosevelt Room at the White House, the coalition attempted to secure official recognition as a legitimate entity representing the interests of a significant number of the victims of drug abuse. Instead, it received a warm welcome and a standard bureacratic putoff: "We welcome your group's input as well as a number of other groups we have to deal with." There are no other minority associations outside of NCEDAA.

However, in fairness to Dr. Bourne, were it not for his efforts, NCEDAA would not have penetrated as far as it has. Because of Bourne's obvious support, NIDA responded with a contract to Creative Socio-Medics, which produced the data relating to the statewide services contract system. Further, the coalition has played a major role in the planning of the National Drug Abuse Conference, which was, until last year, the province of a small elitist group who felt they had a proprietary right to setting the tone and direction of the conferences. In fact, NCEDAA has been a strong force in the democratization of the most important meeting of the year. Participation in both the White House and the conferences has projected some of the coalition's leadership onto the national stage in the drug-abuse field. It is a strange and welcome sight to finally begin to see those representatives at the forefront, although they still are not in positions of great responsibility nationally.

I'd like to close this section with a quote from this writer's speech at last year's conference in San Francisco:

> It is high time, then, to break with tradition, to begin to include those within our society who are neither politically influential nor economically powerful in the development and implementation of public policies. Let's open up the process to responsible, qualified individuals from these communities who are forever ignored and whose destinies are always determined by others. The victims of drugs have no constituency. Listen to those who can, in some way, speak for them.

SOME IMPLICATIONS FOR FUTURE RESEARCH, TREATMENT, AND PREVENTION

The implications, to us at least, are clear; whether we'll be listened to is another matter. Personally, I have strong doubts, since I have always believed that power yields nothing, that those in the driver's seat will not even make room at the top, much less give it up. And the fact is that there is too much at stake here. All of the ingredients are there: money, prestige, position—in short, power. It has always been in the hands of the dominant society; there is little hope to believe things will change. We've gone the only route open to us: organization. In the past we learned to compensate, in small measure, for our political and economic weaknesses through organization of various kinds. Then, we believed those who were threatened by our political potential and we stopped organizing because it was "out of style." Well, it never was and never will be out of style. To some degree we have proven this with NCEDAA. It remains to be seen how far we can take it.

The implications for future research are there for anyone to see. Little or no socially oriented research has been done on the causes of drug abuse in the minority communities. What has been done has been ill-conceived, by nonminorities, having no credibility in those communities.

The basic research problem is conceptual. As long as the top leadership levels continue to follow a medical-technological orientation to drugs, the minority perspective will be neglected. This holds for researchers as well as bureaucrats, but since most drug research is Government financed and monitored, the ultimate responsibility rests at the top policymaking levels. The lack of conceptual awareness is reflected in requests for proposals which seldom seem to address minority concerns; in the past and present funding allocations; and in the lack of receptivity to minority perspectives on those rare occasions when they have been presented to Government bureaucracies.

A change in the basic conceptions would certainly change research orientations. But, since it is unrealistic to expect a bureaucracy like NIDA to instantly and intelligently reverse directions, the following suggestions are made with the understanding that change will be slow, and that what is sought is specific programing and not basic reorientations.

Within the existing budget for drug research, priorities must be changed. The vast amounts spent on medical-technological research (such as on narcotic antagonists, cannabinoid assays, etc.) should be rapidly phased out. I do not have all the answers regarding what research is irrelevant or harmful to minorities, or what alternative research should get top priority, but it appears that NIDA has no clue of what is needed either. Therefore, NIDA's role should be to bring together minority leaders and sensitive researchers to review current research allocations and determine future strategy.

The following steps can be taken immediately:

(1) Institutionally, NIDA should restructure research review boards so that there is a reversal of the current situation in which minority-oriented research is reviewed by overwhelmingly white medical-pharmacological technocrats.

(2) A minority research center should be created, outside Government, to help define minority research needs on an ongoing basis, to conduct some independent research, and to insure that ongoing and future research projects are as relevant to minorities as possible. This center should communicate to minorities the state of research as it affects them.

(3) Past research on drugs—at all levels of the treatment and criminal justice system—should be reanalyzed from a minority perspective. There is a mountain of inadequately analyzed data on which racial or ethnic differences have been coded but barely looked into. In several reports and speeches I have begun the re-analysis of DAWN (and to a lesser degree, CODAP), but the task is enormous and time consuming. However, it is far less expensive than conducting new research, and the result we anticipate will clearly show a need for a minority focus.

A new style of research, in which issues are redefined and considered from minority community viewpoints, is necessary if research data are to capture a sense of reality and relevance to those communities. This means breaking away from using established categories, formal questionnaires, "rock hard" data from statistics to urines, and reliance on computers. This new approach should have a strong ethnographic research component rather than removing the individual—the causes of drug use—from the community and social setting. This new research would have as its goal the determination of the interplay between social context and drug use, as well as the impact of drug policies on minority individuals and communities. People who could take this ground-level perspective must be trained because very few now exist who can undertake such research.

The weight of past evidence and my own personal experiences reinforce my belief that understanding comes from below or within; that there is a chasm from the heights of government to the depths of some streets which has yet to be bridged. NIDA should not determine the style and content of the research and should not try to keep the research "in house" or parcel it out, in drips and drabs, to nearby firms they have close control over.

The implications for treatment are spelled out in the Creative Socio-Medics study of the statewide services contract system.[8] Primarily it recommends more participation by the drug treatment minority community at the State and local level. Further, it underlines the special needs of the small, minority programs. Assistance of all kinds is needed: technical assistance, primarily by minority experts, training in management, evaluation, organizational skills, etc. And States must comply with the law and include minorities at the top levels of the State drug abuse agencies. State plans must take into consideration the special needs of these programs. NIDA can condition the statewide services contracts to assure many of these things actually take place.

Prevention strategies which are thought through and implemented by minorities for minorities must be tried. No one has solved the riddle of prevention. Very little seems to have worked. It is time minorities had a go at it.

I'd like to think, in closing, that things will never be the same again. That the advent of the minorities at the San Francisco Drug Abuse Conference last year marked a turning point in the direction of this field. That my being asked to write this paper is a step forward and that the accessibility we have gained over the past year is not illusory. However, I've seen gains evaporate before, hopes squelched, people turn bitter and cynical with a process that keeps changing rules just as one thinks one has it figured out. All we can do is hope that this time things will be different; that those presently in control really want change.

And we can keep the pressure on.

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[8] See footnote 3.

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psychosocial studies of drug users

This section continues and expands on one theme of the previous section, patterns of drug use, in terms of the careers of users over time. Zinberg, Nurco, and Robins are all concerned with opiate users, the latter two with addicts and Zinberg with those who use at a nonaddictive level. Jessor provides a comprehensive review of the psychosocial literature on marihuana use.

One of the oldest debates in the drug field is on the relationship between drug use and crime. McGlothlin's chapter provides a clear review and a careful analysis of the available data. He breaks down the usual, and probably unanswerable, question "do drugs cause crime" into several specific and researchable questions, and arrives at clear answers to some and practical suggestions as to how the others can be answered.

The editors regard Zinberg's chapter as an extremely interesting, valuable and well documented review of his subject. But in our opinion his data do not yet justify the policy changes he suggests.

Large scale surveys do show that many people have used opiates, even heroin, at some past time. The data show that in most of these cases the drug was used only a few times. In more cases, it was used sporadically over fairly brief periods of time. For clarity, we will label both of these "experimental" users, and we emphasize that they constitute the large majority of nonaddicted opiate users, in the light of presently available data.

Zinberg distinguishes three types of opiate users, compulsive users (addicts), an intermediate group neither clearly addicted nor clearly controlled, and the "controlled." This last group must therefore consist mainly of what we have called experimental users, with a relative handful of the kind of "controlled" users he studied, those who use with a fair degree of regularity over a period of at least a few years without becoming addicted. The theoretical basis for his policy proposals rests on this small minority, but the numerical basis for suggesting that policy changes are needed rests on the experimental users, for whom the theoretical considerations are irrelevant.

This can be seen by asking what would be the point in encouraging, for the experimental users, "social sanctions and rituals similar to those that govern alcohol use," or to "assist the maintenance of controlled use." Such a policy could only increase the amount of opiate use, hardly a desirable goal even if the use were to remain controlled.

Even for the 90 "controlled" users, the theoretical basis for policy changes seems weak to us. In considering the "factors that determine the potential for controlled use," Zinberg does not mention his own description of the 90 controlled users. Seven in ten are female. Only 40 percent come from lower class or lower middle class families, with 30 percent from the middle middle and 30 percent from the upper middle class. More than three quarters had completed 12 years or more of education. Nothing is said about ethnic background, but we suspect minority group members are not numerous. These do not sound to us like the people who constitute the bulk of the drug problem.

This disagreement on policy does not detract from the theoretical, and perhaps eventually the practical, importance of Zinberg's work, and of the further research he suggests. "Loss of control," while never clearly enough conceptualized or operationalized, has long been regarded by many as a defining characteristic of alcoholism and addiction. Zinberg's approach allows control, and how it is maintained or lost, to be studied.

29. Nonaddictive Opiate Use

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Both the viewpoint and the data presented in this chapter are the outcome of my 4-year investigation of controlled opiate use, beginning with the pilot project sponsored by the Drug Abuse Council and continuing in the NIDA-sponsored project.[1] The first section of the chapter will consider the evidence presented by the literature for the existence of extensive nonaddictive opiate use. Second, the chapter will describe several broad patterns of opiate use that have come to light during project interviews with a variety of users. Third, it will discuss the importance of the social setting variable; and fourth, it will briefly outline further areas of research that need to be undertaken, emphasizing the questions raised by my investigation. Finally, the fifth section will make some suggestions concerning public policy and education.

EVIDENCE OF NONADDICTIVE OPIATE USE

The existence of occasional or controlled opiate use has long been recognized by experienced observers, in spite of the traditional view that chipping or chippying—that is, experimental or casual use—was a relatively brief way station leading either back to abstinence or quickly forward to habitual, chronic, heavy use, or regular abuse. The National Commission on Marihuana and Drug Abuse reported in 1973 that 90 percent of Americans disagreed with the statement, "You can use heroin occasionally without ever becoming addicted to it." The existence of hundreds of articles about heroin addiction as opposed to only a few on any other pattern of use attests to the research community's agreement with that view. For example, Chein's group, while noting the existence of "long continued nonaddictive users," concluded that their numbers were insufficient to warrant investigation and that in all likelihood the large majority who continued use went on to addiction (Chein et al. 1964).

Lindesmith (1957) likewise had drawn a distinction between pleasure users of opiates, whom he called "joy poppers," and the prototypical addict. "A 'joy popper,' " he wrote, "is simply an individual who uses the drug intermittently and who has never been hooked." He too suspected that most continuing "joy poppers" went on to addiction. By 1972 Goode was stating the same traditional position somewhat more ambivalently: "The occasional (weekend) heroin user is probably a good deal more common than most of us realize, although an extraordinarily high percentage of those who 'chippy' (experiment) with heroin eventually become addicted."

Of greater importance, however, is a rigorous retrospective study by Robins and Murphy (1967) of a normal population of young Negro males in St. Louis. They found that 13 percent of the total sample had tried heroin and that all but 3 percent had become addicted. All those who had used heroin more than six times had gone on to become addicts.

Any literature search that attempts to determine the extent to which observers have recognized long-term nonaddictive opiate use is hampered by the unwavering acceptance of this traditional view of chipping, which is reinforced by three factors: the concern that the mere recognition of such use might encourage experimentation by the unwary; the difficulty of arriving at any reasonable quan-

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[1] I wish to acknowledge the support for work reported in this chapter provided by the Drug Abuse Council, Washington, D.C., from January 1974 through June 1976; and by National Institute on Drug Abuse Grant No. 1-RO1-DA-10360-01 from July 1976 to the present; and to thank Wayne M. Harding, Shirley M. Stelmack, and Robert A. Marblestone for their invaluable assistance in preparing the chapter.

titative estimates of such use; and the multiplicity and impreciseness of the terms employed to describe drug-using styles. This last point caused Chein et al. to note as long ago as 1964 that the apparently specific term "heroin addict" had been used in so many different ways that "it is meaningless to identify an individual as an 'addict.'" In addition, and perhaps most important, the literature, because of the timelag both in the development and funding of studies of changing patterns of drug use and in publication, includes little up-to-date information on the swiftly changing patterns of drug use of the past 7 years.

Nevertheless, a careful literature review does indicate that patterns of long-term controlled opiate use have existed for some time. Although the literature does not provide quantitatively specific evidence, it does show that there is a considerably higher percentage of opiate users than had previously been supposed. This, however, has not been recognized by physicians and medical clinics other than those concerned with heroin use alone.

In 1961, while working at the Cook County jail, Scher reported on a group of heroin users whom he described as having "what might be called a regulated or controlled habit." Later on, when considering the life cycle of addiction, Alksne et al. (1967) noted with some surprise that "although no research reports are available for this kind of user, our own observations indicate that some persons continue in occasional or limited use for an indefinite period of time without going on to more regular use." These observations almost exactly parallel those reported in 1974 by Newmeyer of the Haight-Ashbury Free Medical Clinic in San Francisco, concerning individuals who, he said, could "be characterized as persons who sample heroin without becoming addicted."

A perspective different from the medical profession's excessive fear of addiction is presented by medical personnel who screen applicants for methadone maintenance programs. Even the guidelines suggested by the American Medical Association (1972) state: "The mere use of a morphine-type drug, even if periodic or intermittent, and/or violation of drug laws cannot be equated with drug dependency. In each instance a specific medical diagnosis is required." The same theme was brought up by Dobbs (1971), who warned that some people applying for methadone maintenance should be rejected because they are only occasional users. It also led to a suggestion by Blachly (1973) that naloxone was useful in distinguishing between addicts and occasional users. Blachly noted that "a significant hazard exists in creating addicts to methadone hydrochloride, since a third of those applying to a methadone clinic without prior documentation of withdrawal in an institution showed no evidence of physical dependence." Glaser (1974), too, suggested that 45 percent of the applicants to a Philadelphia maintenance program were not addicts, although he gave no data on their frequency of use.

The interesting and paradoxical recognition that there are occasional users who, for reasons of their own, present themselves as addicts is not new. Zinberg and Lewis reported on such a group in 1964. In addition, Gay et al. (1974) have published case histories of occasional users who presented themselves as addicts although urinalysis belied their claims. Such individuals were labeled "pseudo junkies" to indicate that they assumed the trappings of addiction without the necessary opiate use.

The reports mentioned so far have simply noted the existence of nonaddicted opiate users. Several other reports, however, have introduced an experimental or quantitative dimension.

Hughes et al. (1971), while studying addicts, used 15 occasional users as a comparison group. Eleven of that comparison group, they stated, became regular, frequent users without progressing to addiction.

In 1971-72, Levengood et al. (1973) conducted a study of single white male heroin users between the ages of 15 and 24 who lived in a Detroit suburb. Although their sample comprised multiple drug users, they examined three distinct subsamples classified by frequency of heroin use. Of the 60 subjects interviewed, 22 individuals (or 37 percent) used "regularly or on a daily basis"; 24 (40 percent) used occasionally, with quantity and frequency of use varying widely; and 14 (23 percent), who had used within the last year but not during the month prior to study, were considered "former users." Some who had recently been using on a daily basis were included in this last group, but none of them had received any form of treatment.

Graeven and Jones (1976), who examined adolescent heroin use in a suburban San Francisco high school between 1966 and 1974, reported that occasional use was almost as prevalent as addiction (49 percent as compared with 51 percent). Of the 143 "experimenters" identified, 33 percent had used between 3 and 30 times, 19 percent had used from 31 to 100 times, and 10 percent had used more than 100 times. Furthermore, by 1974, 24 percent of the addict group were using between once a month and twice a week, with only 47 percent using three or more times a week.

A study of Abt Associates Inc. (1975) on drug use in the State of Ohio showed that 1.39 percent of their respondents admitted having used heroin. If this figure were extrapolated to the general population of the State, the number of users would clearly be greater than any previous estimate of the number of actual addicts. Moreover, the survey indicated that among heroin users occasional use predominated: 8.7 percent used "several times per week or more"; 17.4 percent "a few times per month"; 34.8 percent "a few times per year"; and 65.2 percent "less frequently." The Ohio results are not drastically different from data reported by Abelson and Fishburne (1976) from their 1975-76 nationwide study, which showed that 0.5 percent of youth under age 18 and 1.2 percent of all adults had had experience with heroin. Although generalizations made from such data are hazardous, these findings together with the less comprehensive studies just described suggest that many more nonaddicts use heroin than has been supposed.

Bourne et al. (1975) made an interesting survey of heroin use in Wyoming, where, to their surprise, they found heroin use greater than expected, as well as many different use patterns, including occasional use. Their work contains few counts of the numbers of such users, but it is of particular importance that they take issue with the conventional view that most users are known to the authorities. They uncovered significant numbers of users and addicts who were unknown to the police or to the community health facilities responsible for treatment of drug problems. Hunt, one of the participants in the Wyoming study, used these data along with other data collected with Chambers (1976) to place the heroin-using population of the United States at 3 to 4 million, of whom they claimed that only 10 percent were addicted.

Probably the most important study in this group is that which Robins[2] made of Vietnam veterans 3 years after their return to the United States. Not only is it a more rigorously designed work than any described so far, but it specifically contradicts Robins' own previous work. She found in 1976 that 20 percent (114) of the 571 previously addicted veterans had used opiates occasionally after their return. Of these, only about 12 percent (14) had had any period of stateside addiction. In her study she concludes that this ratio of addiction to occasional use was consistent with patterns noticed in the general U.S. population. Furthermore, she explains that the discrepancy between these conclusions and her earlier St. Louis study (Robins and Murphy 1967) is due to the changing patterns of drug use. While the earlier study had shown that nonaddictive use among blacks was infrequent between the 1930s and the 1950s, such use had become widespread by 1976.

Perhaps the most convincing data showing widespread nonaddictive heroin use come from studies reporting its appearance in other treatment modalities. Minkowski et al. (1972) found more than twice as many occasional heroin users as daily heroin users in a random sample of clients visiting the Los Angeles Health Department Youth Clinic. Excluding experimenters (those using fewer than 3 times), who constituted 12 percent of the 300 respondents, 4.6 percent used between more than once a week and less than once a month, while only 1.7 percent used once a day.

Health consequences usually associated with heroin addiction have been reported to affect occasional users. Kersh (1974) states that 70 percent of the narcotic overdose cases treated in a New York hospital emergency room were occasional users. Light and Dunham (1974) have reported on two cases of vertebral osteomyelitis due to septic intravenous administration of heroin in individuals who had not used heroin for at least 8 weeks preceding the onset of symptoms and who were "definitely not addicts." Lewis et al. (1972) reported that they encountered five occasional users in 1 year who had spinal chondro-osteomyelitis; they were not addicted but all had used heroin intravenously within the week prior to their hospital admission. An independent medical biostatistician is currently studying all these medical figures more closely, and his initial response has supported the conclusions of Hunt and Chambers (1976).

Before my work began, only one study, that by Powell (1973), seems to have been made that was specifically oriented to the occasional heroin user. Of the dozen subjects he recruited through placing advertisements in a counterculture newspaper, none reported previous addiction to heroin and each had used the drug for at least 3 consecutive years. Judging these scanty data by my standards,

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[2] L. N. Robins. Veterans' drug use 3 years after Vietnam. Principal investigator's report to the National Institute on Drug Abuse, 1976.

I would classify only a few of Powell's subjects as strictly controlled users and the others as having a more unstable or "marginal" use pattern.

PATTERNS OF USE

As originally conceived, my DAC and NIDA studies were designed to deal only with individuals whose opiate use was carefully controlled. In selecting subjects, stringent criteria were used to define controlled use. Subjects were required to be over 18 and to have used opiates at least 10 times per year for more than 2 years and at least 2 times during the 6 months preceding the interview. They must not have had more than one "spree"—an instance of from 4 to 15 consecutive days of opiate use—in any of these years. With the exception of tobacco they must have been using all drugs, licit and illicit, in a controlled way and must not have been in a drug-free or methadone maintenance program, in jail, or in any other confining institution during their years of controlled use.

These conditions or standards were laid down to include regular weekend users, who often use 3 days in a row, as well as spree users, who may use for a number of days in a row on a vacation but then demonstrate equally prolonged periods of abstinence. The limit of one spree per year excluded users who might be intermittently addicted.

Finding controlled users who were willing to participate in the research project was at first a time-consuming process. But, as project workers grew more adept and also came across subjects who could help in finding other subjects by penetrating different social networks, it became clear that locating responsive interviewees was difficult not because they were so few in number but because under present social conditions, which condemn and punish any opiate use at all, they were terrified of being discovered. This secretive attitude and fear of discovery stand in sharp contrast to the attitude of the usual addict found in a drug treatment program.

So far the project has located and interviewed 90 opiate users who have been controlled for between 3 and 23 years. They have been found through advertising in newspapers (both regular and countercultural), through community agencies, by professional contacts, and by subject referral. All subjects have been interviewed for approximately 2 hours, 60 have been followed up between 6 months and 1 year later, and 25 of these have had still another interview 1 year after that. In addition, at least 1 friend of each of 45 of our subjects has been interviewed as a way of understanding these subjects social interactions and as a check on the reliability of the data. The requirement that friends be interviewed has been added in the NIDA project only during the last 2 years; hence the smaller number of subjects so treated. Interestingly enough, two of the occasional users had participated in the study of controlled use made by Zinberg and Lewis 14 years ago (1964). That they have continued their patterns of control over such a long period of time indicates the high degree of consistency such patterns can attain.

The following descriptive data are based on my combined DAC and NIDA samples. Because the NIDA project is ongoing, these data are necessarily approximations.

Of the 90 controlled opiate users I have studied to date, some 30 percent are males and 70 percent are females. Their ages range from 17 to 50 years, with a mean of 27 years. Approximately 40 percent come from lower class or lower middle-class families, and the remainder are almost equally split between the middle-middle class and the upper-middle class. Of those subjects who are not currently in school, one-quarter did not complete 12 years of schooling, one-third did complete 12 years (high school), and the remainder completed more than 12 years. All those who are currently in school had previously finished high school.

As for my subjects' living situations and current activities, one-quarter are single and the remainder are divided almost equally between those who are married and those who are living with a mate. About 66 percent are working full or part time, approximately 15 percent are currently employed, and 10 percent are in school either full or part time. Nine of the 90 (10 percent) are engaged in crime or drug dealing, more than half of them on a part-time basis, and these 5 are members of the middle class whose drug dealing is done to help out friends at little or no profit. Of those currently employed, 58 percent are blue-collar workers. The bulk of the white-collar workers hold either clerical or managerial positions. Only 10 percent of the employed are in professional positions, such as nursing. Concerns about confidentiality and about the consequences of disclosure of their opiate use seem to have discouraged the professional, well-educated, and upper-class users from entering my project.

Turning to the actual case of opiates by my subjects, heroin ranks first not only in current use but also as the opiate used most intensively during the subjects' using careers. Well over 80 percent of the sample use heroin. The mean current period of controlled opiate use is 5 years. Most subjects use opiates infrequently. About 20 percent use less than monthly (one to three times a month), 40 percent use monthly, 20 percent use weekly (once or twice a week), and the remainder use in various patterns, combining sprees with more regulated periods of use. More than 25 percent of my subjects have either a history of addiction to opiates or a history of compulsive use of another drug, or both. Their periods of compulsive use, however, have been significantly (at the 0.05 level) shorter than their current period of controlled use, a fact that underscores the importance of controlled use as a comparatively stable using style.

Despite the careful attention paid to personality description and personality formulation in the initial interview, and the additional data supplied by the followup interview and interviews of friends, correlations have not been found between occasional opiate use and specific personality types. At the same time, the interviews have revealed important similarities, which have served to indicate the problems users have in maintaining a stable chipping pattern. Surprisingly, with but three exceptions, my subjects have reported a greater fear of being forced into abstinence than of losing control and becoming addicted.

The chief difficulty in maintaining a pattern of occasional use seems to be the user's need to determine, either alone or in conjunction with a peer group, how to integrate the drug high into his or her regular pattern of work and social relationships. All of my subjects first tried an opiate as part of a series of drug experimentations and found the experience particularly pleasing. They all recognized that they had no social or psychological preparation for opiate use. Their anxious attempts to learn all they could about the drug's actions and effects from peers indicate that they had not gone through the kind of social drug education process that is available to alcohol users in our culture.

Although my sample of 90 controlled users is small, the interview material appears consistent. Taken along with the data obtained by Robins and other researchers, and with a growing body of confirming reports that I have received as personal communications,[3] it reveals the existence of a category of people who have succeeded in setting up a stable pattern of controlled opiate use that does not necessarily lead to addiction. It is impossible to say what percentage of all opiate users this group represents. Some of the data mentioned in the literature review suggest that quite a high percentage of heroin users may not be addicts. But if this finding is correct, and I believe it is, it still does not mean that all of those who are not addicts fall into the category of stable controlled users, nor does it indicate which of the potential experimenters may be reasonably expected to be able to exercise the stringent sanctions necessary for controlled use. As an unexpected byproduct our research has uncovered several different patterns of use falling between the extremes of control and noncontrol.

In the course of recruiting controlled subjects, I unintentionally interviewed people who did not meet the stringent qualifications for controlled users. Rather than discarding these recorded interviews, I decided to analyze and use them as comparative cases. In this way I not only found out that even physiologically addicted users showed some evidence of control and reacted to changes in their social setting, but I also recognized a number of diverse using patterns that, while falling short of my definition of control, did not fit the addict stereotype. Of the 90 primarily opiate-using subjects who were rejected as controlled users by my standards, 18 (approximately 20 percent) reported addiction within the previous 2 years but were not currently addicted, 15 (roughly 17 percent) reported current daily use of a single dose but also did not regard themselves as addicted, and 13 (or about 14 percent) had used occasionally for less than 2 years. Others used different drugs, used them less frequently than my standard required, or had "spreed" more frequently. Fourteen (about 16 percent) regarded themselves as currently addicted, and more than half of these addicts were not affiliated with a treatment program.

Thus my investigation revealed greater differentiation among the various levels of control and noncontrol than I had expected. First, some subjects used heroin several times a day, were physiologically addicted, and showed the stereotypical pattern of using as much of the drug as was available. (Most heroin users who at one time or another have been under treatment probably fall into this category.) Second, some, though physiologically addicted, placed limits on their use. (Sometimes this type is also found in the treatment population.) Third, there were those whose physiological addiction did not disrupt their functioning. (Although users of this type are rarely found in the treatment population in this country, they are found in England.) Fourth, some subjects were not addicted, but their history of addiction was so recent that they could not be considered controlled users. Fifth, some used heroin only occasionally but were more or less compulsive users of other drugs. Sixth, some users could not be defined as either clearly controlled or clearly addicted. These I called "marginal users," thus adding a third category to the two basic types of opiate users (controlled and compulsive) that I had been aware of originally (Zinberg et al. 1977). Not only have many professionals in the field overlooked stable controlled use as a basic category of nonaddictive opiate use, but they have also overlooked a complex and diverse group of "marginal users" who, while clearly at risk of addiction, must still be considered generally nonaddicted.

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[3] J. Blackwell, August 20, 1977 personal communication.

THE IMPORTANCE OF THE SOCIAL SETTING VARIABLE

Once it is recognized that responses to opiate use are far more complex and varied than has usually been assumed, the next essential is to consider those factors that determine the potential for controlled use. It is my contention that three variables determine the style and consequence, and therefore the degree of control, of drug use: drug (the pharmacological properties of the drug itself), set (the user's personality and his or her attitudes toward taking the drug), and setting (the characteristics of the physical and social setting in which use occurs). In theory each of these three variables can be manipulated to prevent abuse or to improve treatment methods. In fact, however, it is not easy to manipulate the first two.

In the case of the drug variable, attempts to prevent abuse by reducing the supply of opiates have proved costly and only partially successful because of the high demand for the drug, the windfall nature of black-market profits, and the permeability of national borders. Even if the supply is reduced, opiate users tend to substitute alcohol, barbiturates, pharmaceutical opiates, or other drugs instead of stopping compulsive use or going into treatment (Association of the Bar of the City of New York 1977; Newman 1974). Similarly, attempts to improve treatment methods solely through manipulating the drug variable, such as the use of methadone and other agents, have been only partially successful. Drug therapy programs appear to work well for only a portion of the client population, and those who enter such programs probably constitute only a small fraction of those who are genuinely addicted (Chambers and Inciardi 1972; Nightingale 1977).

Prevention and treatment strategies grounded in the relationship between drug use and the set variable are also inadequate. Although some opiate abuse undoubtedly is related to personality disorders or social deprivation (Chein et al. 1964; Khantzian 1974; Khantzian et al. 1974; Yorke 1970), it is difficult to see how those who are "addiction prone" by psychological makeup and social background can be identified and persuaded to remain abstinent. In addition, it is by no means clear how many opiate users are or have been deficient in these areas. When prospective work has been done with subjects who later turn out to be addicted, the personality aspects accounting for their addiction have not been clear (Zinberg 1975).

Because of the difficulty in manipulating the drug and set variables in order to prevent abuse or improve treatment, my research has emphasized the importance of the third variable—the physical and social setting. This work has shown that embedded in the setting in which use takes place are a number of social sanctions and social rituals that influence individuals' decisions to use a particular drug and also the way in which they use it. Social sanctions are the norms and beliefs concerning not only the ways in which a particular drug should be used but also the ways in which its harmful physiological and psychological effects can be avoided. Rituals are stylized drug-using behaviors and practices, including the means by which the drug is obtained and administered, the physical setting chosen for use, the using circumstances and using companions selected, the user's activities when intoxicated, and any specific activities undertaken after intoxication that the user regards as part of the using process (Harding and Zinberg 1977). For example, a primary sanction of controlled opiate users is "Don't use enough to become addicted," which is reflected by the rituals and behaviors related to frequency and time of use, such as use on weekends only.

Nevertheless, rituals do not act to control use unless they are based on limiting sanctions. Although addicts follow some of the rituals adopted by controlled users, deciding who "gets off" first, sharing "works," "tying off" with belts, or "booting," these rituals do not operate as controls because they are not grounded in sanctions. On the other hand, the controlled opiate users I have studied have internalized the social sanctions or precepts that tend to control drug use. They are even able to articulate these sanctions, sometimes explicitly and consciously, and sometimes in fragmented form, without conscious knowledge that they are following certain rules.

Thus social sanctions, internalized by the user, are the predominant sources of control, and rituals buttress, reinforce, and symbolize these sanctions. Rituals and social sanctions seem to function in four distinct ways. The following list explains these functions by referring to my research subjects.

1. Sanctions define moderate use and condemn compulsive use. (Most of my subjects follow sanctions that limit use to frequencies well below those required for addiction. Many have special sanctions, such as "Don't use every day" or "Never use on more than two consecutive days.")

2. Sanctions limit use to physical and social settings that are conducive to a positive or "safe" drug experience. (Some subjects refuse to use in the company of addicts from whom they have bought the drug, and most avoid driving a car when high.)

3. Sanctions and rituals identify potentially untoward drug effects and prescribe precautions to be taken before and during use. (Some subjects minimize the risk of an overdose by using only a portion of their drug and waiting to gauge its effect before taking more. Others avoid mixing certain drugs, boil their works before injection, or refuse to share works.)

4. Sanctions and rituals operate to compartmentalize drug use and support the users' everyday obligations and relationships. (Some subjects avoid using opiates on Sunday night so that they will not be too tired to go to work on Monday morning. Some carefully budget the amount of money they spend on drugs.)

The process by which controlling rituals and social sanctions are acquired varies from subject to subject. Most users come by them gradually during the course of their drug-using careers. But peer using groups seem to be the most important source of practices and precepts for safer use. Most of my subjects appear to require the assistance of other controlled users to construct appropriate and effective rituals and sanctions out of the folklore and practices circulating in the various drug-using subcultures (Harding and Zinberg 1977; Zinberg et al. 1977).

DIRECTIONS FOR FURTHER RESEARCH

Because the samples studied in my DAC and NIDA projects were not random, and there is no assurance that they are representative, they do not provide generalizable data on five important topics: (1) the extent of opiate use, (2) the rapidity with which using patterns change; (3) the relationship of opiate use to other drug use and the stability of that relationship; (4) the connection between opiate use and demonstrable psychological difficulty; and (5) the leading demographic and social characteristics of users. The lack of such knowledge is serious (Heller 1972); it would be extremely helpful both in identifying the difficulties that lead to and result from opiate use and also in deciding public policy issues. It is unfortunately true that the criteria being used in 1978 to determine the extent of opiate use, such as arrest rates, overdose deaths, and applications to treatment programs, relate only to the stereotypical addict and ignore the broad range of users (Greene et al. 1975; Johnson 1977; Weissman and Edie 1976).

The best way to provide information on the first four topics would be to construct and survey a carefully designed random sample of opiate users. The sample would need special construction because, even including the one-time experimenters, opiate users make up only a tiny fraction of the population (Robins et al. 1977). But such survey data would provide little information on the fifth topic, the main characteristics of users: who can use, their degrees of control over use, and how they maintain control (Hunt and Chambers 1976). Only a qualitative and precise study of the concept of control itself could explain why some users do well at maintaining control while others control their use only moderately well, poorly, or very poorly (Zinberg et al. 1977).

To indicate and understand some of the ways in which control functions, and to test the general applicability of concepts of control, as well as the variations within the range of opiate-using types, information should be gathered on the extent to which all types of users have been exposed, knowingly or unknowingly, to sanctions and rituals and to what degree they have followed them. Information is also needed on the extent to which style of use is affected by background and personality and by the individual's decision to center control outside himself or herself, perhaps by letting someone else keep the drug supply. Groups of addicts both outside and within treatment programs should also be investigated, both for the purpose of comparing them with controlled and marginal users and as a potential measure of the social evolution of the drug-using process. Interviews with addicts who have never been in treatment show that they feel greater concern about controlling their use than do those within treatment programs, who hardly believe that control is possible.

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Long-term longitudinal studies are needed to investigate these subtle aspects of control. At the same time, such studies could provide information on two other important topics: patterns of drug use and the ability of users to predict their future use patterns.

Longitudinal studies would be useful in measuring the stability of the various drug-using styles and detecting changes in the three basic variables of drug, set, and setting. In such a study the following kinds of life changes should be considered in relation to their impact on subjects' using patterns: death of mate, spouse, or other family member; change in health; change in job; geographic move; change in schooling; change in friends; change in drug supply; and change in using group or groups. A longitudinal approach, which would allow subjects to be interviewed during these life changes or soon after they had occurred, would elicit more reliable data than a strictly retrospective approach.

A longitudinal approach could also be used to test the subjects' own predictive abilities. It would indicate how correct subjects are in predicting what their future drug use will be and in projecting the effect of various changes on their use. Simultaneously it would permit observation of the extent to which subjects' rules for use (social sanctions and rituals) become more internalized and often more conscious.

PUBLIC POLICY AND EDUCATION

The review of the existing literature, the research described here, and a spate of personal communications show that not all groups of opiate users become addicts. Until longer term, more quantitative studies are completed, it is impossible to predict what percentage of experimenters will become addicted and what percentage will not. It is my impression that one of the most critical factors contributing to the development of controlled use, not only of the opiates but of any drug, is the attitudes and values of the larger social setting, which, in turn, are translated into social sanctions and rituals. In part, these attitudes and values are expressed in public policies and in the education about drug use that is offered by official bodies.

Until now, public policy has been essentially prohibitionist. Grounded in the conviction that all opiate use leads to addiction, and that addiction is the whole problem, it has dealt solely with the fraction of dysfunctional addicts in the population and has failed to take account of the range of users who are not addicted but are capable of stable, controlled use. Moreover, public policy has been almost exclusively directed toward the drug variable. Policymakers have recommended reducing supplies so that addicts cannot get their drugs and will be forced into treatment situations, an outcome that is expected to improve the set variable. So far policy has made only negative use of the setting variable, which admittedly can have either a reinforcing or a restricting effect upon the individual's potential to exercise control. Policymakers, instead of considering the possibility that use can be controlled, have attempted to inhibit all use. While searching for methods of dealing with the heroin issue that would calm public fears, they have failed to realize that their own policy may be stimulating those fears.

If, as I contend, the use of opiates and other illicit drugs is indeed an evolving social process, the recognition that the social setting strongly influences the capacity for control offers an alternative to prohibition. Elements of potential control are active in all groups of opiate users, even among addicts. Many opiate users, representing many different styles of use, have precepts, however punitive, that dictate how they can use their drug without becoming addicted or suffering physical and psychological damage, or, at least, how they can use the drug in order to get what they desire from it. Is it not possible that using groups will gradually develop these ideas into social sanctions and rituals similar to those that govern acceptable alcohol use (Zinberg et al. 1975)? Although the sample studied in my NIDA project is small, the fact that many of those who fulfilled the project's stringent criteria for controlled use had formerly been addicted suggests the need to consider approaches other than abstinence. For example, assisting the maintenance of controlled use could be a practical means of preventing drug abuse with the least social cost; and experimenting with this alternative in a careful and gradual way would not obstruct the effort to discourage the use of the opiates generally.

If, as I contend, the use of opiates is a socially evolving process in which the social setting variable plays an important part, it is essential to reassess the current treatment programs for addicts. The bulk of these programs has grown out of the public policy decision implicit in the creation of the Special Action Office for Drug Abuse Prevention (SAODAP) in 1971. That policy decision to make drug treatment available to all who needed it may have been a forward step in 1971, but in 1978 it has very different implications.

Recently Nightingale (1977) reported that, while there are approximately 150,000 to 170,000 persons in treatment and another 100,000 in jail for opiate addiction at any one time, there are "another 300,000 to 400,000 not in treatment, the majority of whom have never been in treatment." This strongly supports the following conclusion of Bourne et al. (1975) regarding opiate use in Wyoming: "Very little is known about the characteristics of undetected opiate users," particularly by official bodies, such as the Drug Enforcement Administration, and treatment programs.

Another even more recent study of treatment programs (Millman and Khuri 1977) also seems to suggest that the way in which opiate users view treatment has changed sufficiently to warrant a reassessment of treatment per se as well as of the public policies determining its form. In sharp contrast to earlier studies by Vaillant (1966), who found few if any seriously emotionally disturbed clients in treatment programs, Millman and Khuri suggest that treatment programs are becoming wastebaskets for those addicts who have been remanded by the law enforcement system or who, because they are also in serious pyschological difficulty, are incapable of functioning elsewhere.

If approaches to treatment were to be reassessed from the viewpoint of the social setting variable, it would first of all be necessary to combat the belief that heroin is "the devil drug." True, heroin is a powerful, highly addictive substance whose potential for individual destruction in this country, as it is now used and as it is now viewed, is enormous. But, like many other drugs used medically, it is deadly only when used improperly. In other countries, such as England and some of the European States, heroin is regarded as medically useful.

At this time, heroin maintenance is not a viable treatment alternative in this country because of the public attitude toward the drug, the well entrenched black market, the sheer numbers of addicts, and the difficulties of administration. But with a change in public policy I can imagine a series of small, carefully designed experiments intended to determine whether the many addicts now avoiding treatment could be brought into treatment. Those experiments would try to determine and give to addicts what they want from the street drug experience, such as getting their preferred drug on a weekend, in the morning, or at night, while maintaining them on oral methadone the rest of the time. It is a measure of our tremendous overconcern with heroin that during the last 10 years of high levels of addiction, not one small experiment of this kind has been carried out.

The National Institute on Drug Abuse has responded to the slight change in public attitude by funding a study of the efficacy of heroin as an analgesic. If heroin indicates any advantage over other available analgesics for even a small percentage of patients in pain, its use should be permitted. Also, the drug is much favored in other countries as an antitussive. The increased medicinal use of heroin along with its experimental use in drug treatment programs would not only add another substance that could be used humanely to alleviate suffering but would also begin to provide some knowledge of the drug's advantages, disadvantages, and side effects, as well as of individual differences in toleration. Objective knowledge about a drug, whether it is alcohol, strychnine, cortisone, or heroin, enables individuals to decide about its use in a more realistic way than when they are influenced by users who view it as a god or by the general public, which views it as a devil. The hyperemotional atmosphere surrounding the present use of heroin may actually be causing those to try it who can handle it least well.

The use of heroin in the ways just mentioned will only be possible if the prevailing view about drug use (abstinence versus addiction) can be shaken. The medical profession in particular must reassess its position because its cooperation will be critical in bringing about any change in heroin use and in the public understanding of that use.

My informal survey of medical teaching in this area in 1976 has shown why physicians feel insecure about the illicit drug issue. Every one of the medical lectures and courses I surveyed discussed the various addictions (opiates, barbiturates, alcohol), the noxious sequelae of use of certain drugs (psychedelics, cocaine, amphetamines), and the health hazards surrounding marihuana use. But none of them threw any light on the using patterns that lead to responsible use and even to beneficial relaxation.

Thus, medical education provides physicians with little of the information that they need when called upon to prescribe drugs now used illicitly. It prepares them inadequately for the frequent questions and requests for advice about the use of these drugs. The great majority of doctors seem to have accepted the abstinence-addiction alternative that has led to a prohibitionist public policy, and to be answering the public's questions from that position.

Such a response in the face of the constantly increasing use of illicit drugs has shaken public confidence in physicians. Their constant call for abstinence, except in the case of medical use, may even have led to a general weakening of their ability to promulgate social sanctions about drug use in general.

A good example would be the considerable misprescribing of amphetamines and barbiturates by physicians a few years ago. Physicians' overprescribing may well have occurred partly as a defense against patients seeking psychoactive drugs from other sources, or partly as an unconscious exaggerated response to the lessened power of physicians' instructions, or both. Whatever the specific reasons for the difficulty, the problem not only left the profession generally looking incompetent but, more important, exposed the extent to which most doctors did not understand the management of psychoactive drugs. Broadening physicians' education in this area and enhancing their role as purveyors of moderation rather than abstinence may help restore their reputation for wisdom in this field.

A new awareness of the existence of nonaddictive opiate use, of its complexity, and of the need for a broad study of control factors may bring about small changes in public attitudes and may help the medical profession and policymakers to see that the time is ripe for change and experimentation. An investigation of the exercise of control, particularly in relation to social sanctions and rituals, could have far-reaching effects. Long-term studies of controlled use, though considering primarily the opiates and other illicit intoxicants, may also have important implications for alcohol use and many other habitual behaviors.

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30. Etiological Aspects of Drug Abuse

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A very large number of people take drugs, including those who smoke tobacco, drink alcoholic beverages, ingest diet pills, and take sedatives at bedtime. Others sniff glue, smoke marihuana, take LSD, and inject heroin. A complete list of the kinds of substances used and abused would be very long; it would also reflect great individual differences.

Yet all drug users, regardless of the drug involved or the frequency of use, share one important trait. They take drugs because of a desire to do so, though the nature and origin of this desire may differ. In certain circumstances, of course, drug taking is involuntary, as in medical emergencies where drugs are administered as a part of treatment. However, the decision to use a particular drug is usually a voluntary one. Such a decision is just as evident when someone buys an over-the-counter drug as when a person obtains and smokes marihuana.

Most drug users believe they know and are able to explain why they choose to take drugs. A smoker may explain that lighting a cigarette makes him feel more at ease in an otherwise awkward situation. A typical comment from a social drinker is that a cocktail before dinner is relaxing and a part of his lifestyle, while a heavy drinker may explain that alcohol enables him to face his problems from day to day. Many marihuana smokers state that they first tried that particular substance out of mere curiosity. To some, it was a meaningless experience never to be repeated; to others, marihuana provided a sense of relaxation and freedom far greater than alcohol ever did.

For some individuals, however, drugs are more than just helpful—they are necessary. Such persons are truly dependent on one or more drugs, usually for complicated physical, psychological, social, and economic reasons. In such instances, it is clear that drug taking no longer represents drug use but rather drug abuse, and serious problems are likely to ensue.

In-depth consideration of all types of drug use and abuse would require a volume. Therefore we will confine our attention largely but not entirely to narcotic abusers—users of opium and its derivatives or synthetics. A focus on this subgroup of drug users has special utility since the narcotic addict is the social casualty for whom society has expressed the most alarm. Thus it may be helpful to look at the typical addict to see how the addictive state was achieved. This can best be done by viewing addictive behavior as an end result on a continuum; that is, the addict is one who, after trying alcohol, moves to illicit drugs, then to narcotics, and finally, to narcotic addiction. This is not to say that all those who drink or experiment with illicit substances become narcotic addicts, nor even that all narcotic addicts begin their careers with alcoholic beverages and move through each stage to narcotic addiction; however, our present state of knowledge indicates that most do. The addict who starts his/her drug career on heroin is the exception.

PRECURSORS OF ADDICTION

Several studies have shown that narcotic addicts start drinking alcoholic beverages in their early teens, and that the age at first drinking for s[illegible] addicts has been steadily decreasing over the past 25 years. Such an age decrease is true for the general population as well. However, addicts appear to begin drinking before their age and social class peers in the general population—that is, addicts might be called "norm breakers." Not only do they appear to be more deviant than the general population, but they prove this by engaging in the "marginally acceptable" before others do. Moreover, some investigators believe that addicts come from family backgrounds different from those of the community in which they live. For example, one set of theories postulates that white addicts bring to their addiction more psychopathology than their nonaddict peers, and that the parents of black addicts are not as able as their neighbors to prepare their children for the demands of an urban society.

The Role of the Family

Much of the literature on drug abuse gives the impression that the addict is the starting point, a kind of conceptual "given" that requires no further explanation as to origin. Moreover, drugs are typically viewed as the crux of the problem: ". . . inherently evil chemicals which grab a person by the throat, throw him into the gutter, and hold him there" (Stanton 1977). As several writers have noted, people use drugs, so drug use is a people problem. Thus, studies of the role of interpersonal relationships, especially within the family unit, are vitally important in determining the impact of such interactions in fostering or preventing drug abuse.

Studies of family and drug abuse have been increasing in recent years, and the literature and findings in this area have been well reviewed by Stanton (1977). These studies report several interesting findings: (1) the frequent occurrence of a dominant, overprotective mother (Ganger and Shugart 1966; Torda 1968) and a detached, uninvolved, or absent father in the male addict's family of origin (Eldred et al. 1974; Kolb et al. 1974; Lieberman 1974); (2) a tendency for male addicts to continue living arrangements with their mothers or other female relatives long past the usual age (Noone and Reddig 1976; Vaillant 1966); and (3) the likelihood that single-parent families introduce distortions in parent-child relationships that promote or foster drug use and abuse. It should be borne in mind, however, that as such arrangements become more common and hence by definition less deviant, their relationship to addiction may be correspondingly reduced.

On the other side of the coin, studies of families who rarely if ever use drugs may be equally enlightening. Such low or nonuse families appear to subscribe to traditional values, including perceived love between offspring and parents; parents more influential than peers; tendency to underplay frustrations and to deny negative feelings; considerable religious involvement and avowed love of country; emphasis on self-control and discipline, especially with respect to child rearing; and adherence to traditional sexual roles. It is important to bear in mind, however, that all of these attributes are best regarded as correlates or concomitants, since causal relationships with the absence of drug abuse have by no means been established. Nevertheless, the suggestion of a causal role is highly persuasive.

Theoretical Explanations

Clearly, additional information is needed to explain why some individuals can experiment with drugs to the point of addiction and then spontaneously stop, while others become addicted.

Several explanations have been given why some individuals choose to commit themselves to a career of addiction. Lettieri (1978) has discussed a wide variety of such theories in considerable detail. In our own research, we have adopted the following six explanations or theories for addictive behavior. These provide a basis for understanding the etiology of narcotic addiction. They are by no means mutually exclusive and more than one can apply to any given individual.

The first explanation is based on the notion that some individuals are easily frustrated and deal with their frustrations by becoming aggressive (Dollard et al. 1939). Unfortunately, the aggressive behavior they enter into proves to be both destructive and costly. With their discovery of heroin, they find a substance which dampens or sedates their feelings of both frustration and aggression, and thus they avoid the problems associated with either. In short, heroin use has provided an escape from their inability to cope with intense feelings of anger (Nurco 1971).

A second explanation for addictive behavior focuses on children who were severely deprived at a time when they were totally dependent on others for their basic needs such as food and shelter. They experienced waiting as intolerable, and since they had to do a great deal of it, their personalities became permanently damaged. In effect, "they want what they want when they want it" and are unable to defer gratification (Sullivan 1953). When such individuals discover addictive narcotics—especially heroin taken intravenously—they experience immediate gratification; in effect, they satisfy all their needs or "libidinal desires" at once (Nurco 1971).

Alternatively, it has been pointed out that narcotic addicts often have an inability to establish adequate sexual identification (Chein et al. 1964), and they refuse to compete in a world that requires them to take responsibility for heterosexual behavior. Moreover, they have found that heroin taken in sufficient quantities "wipes out" sexual desire.

Since this is common knowledge within the addict subculture, an advantage in joining such a group is that no one even expects the new member to assume a heterosexual role.

A fourth explanation for addiction is that society does not always provide a sufficiency of legitimate means to realize normatively prescribed goals. This situation provokes breakdowns in the system (Merton 1957). Thus, many addicts reject legitimate means for attaining these goals, as well as the goals themselves, and substitute their illegitimate ones, at least from the point of view of the larger society.

Fifth, it has been theorized that addicts are more likely to take inappropriate risks as a means of proving themselves adequate. In their earlier days, these are the youngsters who stand on the railroad tracks longer than anyone else when a train is coming, or who may be the first to leap from one building to another to indicate their fearlessness. In their own community, they know that taking heroin or some other narcotic-addicting drug is the biggest risk of all.

A sixth, and final, explanation invokes the concept of boredom. Many individuals experience extreme boredom, which can lead to depression and inability to function. One mechanism for fighting off such boredom is frantic pursuit of almost any activity. Applied to narcotic addiction, such a theory provides a "double reinforcement" rationale. In seeking narcotics, the addict runs about filling up his day with "taking care of business" (Preble and Casey 1969) and thus alleviates boredom with these activities. After the individual has taken the narcotic, the drug experience itself removes the boredom and the cycle is further strengthened and repeated.

THE PROGRESSION TO ADDICTION

As noted above, various aspects of the individual's family and psychological background may contribute to this progression to addiction. One facet of this progression concerns the specific pathway into addiction. Narcotic addicts typically have used and abused a variety of other substances before embarking on their narcotic addictive careers, and different persons use different substances for different reasons at different times. The findings of various researchers have indicated some interesting trends in drug use and abuse over the past 30 to 40 years. We have summarized some of these findings at length because it is our belief that the most meaningful suggestions for prevention and treatment must develop out of an understanding of the actual patterns of drug addiction currently prevalent.

First Use of Alcohol

One major study (O'Donnell et al. 1976) reported that young males in the general population took their first drink of alcohol at an average of 15 to 16 years of age, with those born in more recent years taking their first drink even earlier. Blane and Hewitt (1976) have also reported that high school and college students are progressively taking their first drink at a younger age.[1] A similar decline in the age at first alcohol use was found in a 25-year study of narcotic addicts in an urban area (Nurco et al. 1977).[2] Interestingly, white addicts in this study typically averaged 2 years younger than black addicts at the time of their first drink. In addition, it was found that whites usually indicated beer as their first alcoholic beverage, while blacks showed a preference for wine.

Use of Other Drugs

After experimenting with alcohol, nonaddicts as well as narcotic addicts often try other drugs. In the past, marihuana was the most frequently tried drug after alcohol. In more recent years, inhalants such as glue have been slowly replacing marihuana as the first illicit drug used after alcohol.[3]

O'Donnell et al. (1976) have reported on the age at first use of a variety of licit and illicit substances ranging from cigarettes to heroin. Their data make clear that most drug users have begun their use at progressively younger ages over time, regardless of the substance involved.

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[1] The average age at first use of alcohol for students surveyed between 1951 and 1965 was 13.5 years. For students surveyed between 1966-1975, the average age at first use had declined to 13.2 years.

[2] D. N. Nurco, I. H. Cisin, and M. B. Balter, "Trends in the age of onset of narcotic addiction." Unpublished manuscript, 1977. (Available from David N. Nurco, 1229 West Mount Royal Ave., Baltimore, Md. 21217.) Among white addicts of predominantly lower socioeconomic status, age at first use of alcohol was found to decline in essentially linear fashion from approximately 15 years (from the late 1930s through the forties) to 12-14 years (in the late 1960s and early 1970s).

[3] One recent study found that white addicts increasingly used inhalants as the first drug after alcohol. For those who became addicted to narcotics during the late 1930s to the mid-1950s, none used inhalants as the first drug after alcohol. However, for those who became addicted during the mid to late 1950s, 12 percent started their illicit drug progression with inhalants. Moreover, 30 percent of those who became addicted in the early 1960s, and 45 percent of those who became addicted in the late 1960s, did so with these drugs. A similar trend was noted among blacks as well, but to a lesser degree. D. N. Nurco 1975 letter to Robert L. DuPont on subject of tabular analyses of use of inhalants as the first drug tried by narcotic addicts, derived from a sample of a community-wide population of narcotic abusers.

First Opiate Use

Turning to a consideration of age at first opiate use by subsequent narcotic addicts, a somewhat more uniform picture emerges and definite trends over time are difficult to discern. Several investigators have reported that the average age of first narcotic use is in the late teens.[4]

Nature of First Narcotic Drug Tried

One recent study of urban users found that heroin is the narcotic first tried by blacks (Nurco et al. 1977).[5] The only exception was during the early 1960s when blacks increased their use of liquid codeine, and, in fact, exceeded whites in their use of that drug for that period. This is particularly interesting since overall whites used liquid codeine as a first narcotic nearly 50 percent of the time although they did use heroin as a "starter" narcotic quite often as well.[6] Whites also had a tendency to use many different narcotics, particularly in the 1950s and early 1960s, thus showing an erratic pattern in the first narcotic drug used as contrasted with blacks, who basically preferred heroin although they did use liquid codeine as well.

With respect to mode of administration, blacks in 60 percent of the cases injected ("mainlined") their first narcotic, with some decrease in this mode of use over time in favor of ingestion and "snorting" (inhalation). Whites, on the other hand, vacillated between mainlining and oral use of their narcotic.

Temporal Trends

It seems clear that the age of first opiate use by narcotic addicts has tended to remain fairly stable across time except during periods of a "narcotic epidemic." During these periods, there is a strong tendency for the age at first narcotic use to decline; afterwards, it appears to revert to "preepidemic" levels. The actual narcotics used vary according to availability and fads among adolescents in a given area, such as the fad for liquid codeine noted earlier among individuals who became addicted during the mid- to late-1950s.

It now appears that as one drug such as marihuana becomes more acceptable to the general population, those with a strong tendency toward narcotic addiction have to change the manner in which they pursue their deviancy as well as their addictive careers. There does appear to be a need to experiment with illicit drugs before starting on an addictive career. However, age at this experimentation has varied over the years, with different patterns for white and black addicts (Nurco et al.).[7] The reasons for this variation need to be examined more closely to see what effect world events and community pressures have on such addictive progression.

CIRCUMSTANCES SURROUNDING FIRST NARCOTIC USE

Brown et al. (1971), continuing in the tradition of Chein et al. (1964), have sought the addicts' own ideas as to the reasons for and circumstances surrounding their addiction. They report that peer and community pressures are among the most important influences on the decision to take drugs. Community pressures are generally thought to be positive in terms of helping individuals conform to society's norms, but Brown et al. (1971) suggest that heroin addiction, at least in certain urban environments, may be less a response designed to meet the pathology of the individual than a response designed to meet the pathology of the community, i.e., the pathological social situation in which the individual finds himself.

Peer Influence

In any case, there appears to be no doubt that peer pressure in beginning narcotic use is overwhelmingly important. In the study by Brown et al. (1971), influence of friends and/or relatives was found to be a major reason for first use of heroin in 47 to

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[4] Chambers (1974), in an analysis comprising data from 69,887 addicts in treatment, reported a median age of first opiate use of 18 years. A similar estimate can be extracted from the tables of Doran and Sells (1972), as well as from those of Lukoff (1974). In our own studies of urban narcotic addicts stratified by year of addiction, there is an irregular pattern of median age at first use over the 35-year period studied. For both blacks and whites, it was earliest during the period from 1955-59 (17.35 years for blacks, 16.60 years for whites) and latest during the period from 1965-71 (21.40 years for blacks, 19.80 years for whites). Overall, the median age of first narcotic use among black addicts was 18.30 years (mean=18.79); for white addicts, the corresponding median age was 17.55 years (mean=18.46).

[5] See footnote 2.

[6] Interestingly, both whites and blacks in this study recognized rather quickly that they were addicted to narcotics—both the mean and median in this regard were from 2 to 4 months from time of first use, with little variation over the years or between the races.

[7] See footnote 2.

68 percent of the cases. This influence was found to be particularly prominent among females and juveniles. In a similar vein, a comprehensive survey of addicts treated at six different centers across the United States reported that 2 out of 3 addicts say they were introduced to narcotics by friends (Friends Psychiatric Research Center 1970). However, as the study points out, all such data are based on addict self reports; as such, they may be colored by perceived self-interest.[1]

Our own research on urban addicts brought out some interesting details concerning the circumstances surrounding first drug use (Nurco 1976).[8] Both whites and blacks in our study reported two major but opposite behaviors at the time of first use of narcotics. "Just hanging around" was the predominant mode of behavior, among whites; blacks, however, showed a slight preference for being "involved in an activity."

Location of First Use

Addicts interviewed for our study reported taking their first narcotic in a variety of places, most often a friend's dwelling or some public place.[9]

Companions at First Use

The subjects (males) in this sample tended to be in small groups (two to six persons) when they took their first narcotic. Whites were generally in smaller groups than blacks in the earlier years, but this pattern was reversed in more recent times. Our data also revealed that over 90 percent of those present at this time were males. However, only about two-thirds were considered to be close friends.

Obtaining the First Narcotic

Most addicts were given the drug. Dealers were rarely present at the time of first use of narcotics, with no major changes for either race over time. However, a substantial number of whites (42.1 percent) reported also buying the drug.

It seems clear that friends play a prominent role in initiating an individual into narcotic use. Community pressures also have an influence, as highlighted in studies of the relationship between addiction and employment, and addiction and crime. These are reviewed in the next two sections of this paper.

EMPLOYMENT

Narcotic addiction is, of course, most prominent in large, inner-city ghettoes where poverty is common. Unemployment is a daily fact of life, with perhaps 50 percent of such poverty area residents not participating in the legitimate labor force. As Ward (1973) has noted, the absence of employment robs individuals of the status typically afforded by a trade or profession. At the same time, the absence of formalized and long-term family arrangements leads to a type of extended adolescence, at least with respect to steady or long-term employment. In such a situation, status is acquired through illicit activities.

Comparatively little information is available concerning addict employment prior to addiction. O'Donnell (1969) has noted that less than half of addicts studied show a pattern of steady employment prior to becoming addicted. Similarly, Nurco and Lerner (1974), in a study of the occupational skills and vocational histories of narcotic addicts, have found a 47.5 percent unemployment rate.

This study found that the most frequent job classifications among the employed were service occupations (10.1 percent), clerical and sales (9.0 percent), structural work (9.0 percent), and processing, machine trades, and bench work (12.2 percent). As to the reasons for leaving jobs prior to addiction, approximately half left of their own volition for negative reasons (personnel conflicts, drug use, incarceration, and family problems), whereas approximately 35 percent left voluntarily for positive reasons (better job, job training program, self-employment, or armed forces). Interestingly, only 15 percent of all terminations were employer initiated. The longest duration at continuous employment was typically between 7 and 12 months; less than 15 percent of the entire sample studied were continously employed for 24 months or longer. However, the significance of these figures must be evaluated in light of the fact that the average age at addiction for the group studied was approximately 20 years.

Data concerning employment after addiction are much more extensive, but they are also much less germane to the topic of etiology. Extensive discussions can be found in the previously cited work by

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[8] D. N. Nurco, "Early drug use in a community-wide population of narcotic users." Unpublished paper 1976. (Available from David N. Nurco, 1229 West Mount Royal Ave., Baltimore, Md. 21219.)

[9] Blacks tended most often to try their first narcotic at a "friend's place;" in the late 1960s, however, there was a tendency to move to a "public place." Whites, on the other hand, preferred a public place, but in the late 1960s a preference was noted for taking the first narcotic at a friend's place.

Ward (1973) as well as O'Donnell (1969), among others. (For a fuller discussion, the reader is referred to another chapter in the present volume, "Addict Careers".)[10]

CRIMINAL ACTIVITY

Numerous studies have documented the strong relationship between narcotic use and criminal activity. This is to be expected not only because trafficking in narcotics is itself legally forbidden, but also because few addicts have the financial resources to maintain their habits without recourse to illegal activities. The more interesting question is whether criminality, and deviance in general, primarily precedes, accompanies, or follows the drug-taking behavior. Of course, these three possibilities are not mutually exclusive, and any one of the three may be primarily true for any given individual. However, different investigators have emphasized differing aspects of the relationship, thus concluding on the basis of their data that criminal activity was primarily either a cause, a concomitant, or an effect of narcotic addiction.

Setting aside the notion of cause for the time being, there can be little doubt that substantial numbers of narcotic abusers have engaged in criminal activity prior to their first use of narcotics. Winick (1974) states that criminal offenses by addicts subsequent to addiction are "an extension of behavior that preceded drug use." This position is consistent with the findings of Lukoff (1974). McGlothlin et al. (1978) found an 80 percent preaddiction arrest rate in their sample of addicts, but they suggest that this figure may be atypically high owing to certain extreme characteristics of the particular population studied. Voss and Stephens (1973) reported only minimal criminal activity among a wide variety of abusers prior to first use of drugs. However, Willis (1971), in a report on the criminal behavior of hospitalized heroin addicts in London, England, found that 76 percent were "convicted by a court before drug addiction." Moreover, Nurco and DuPont (1977), in a study of criminal activities occuring within a community-wide population of male narcotic addicts, found on the basis of official FBI reports that fully 40 percent had histories of crime prior to their first use of narcotics. Further, 22.5 percent engaged in criminal activity between the time of first narcotic use and the onset of addiction. (For a discussion of criminality after the onset of addiction, see chapters on Addict Careers and Drugs and Crime.)

In concluding this section, it might be well to mention the radical, sociopolitical analysis of the addiction street-crime syndrome provided by Karmen (1974). Karmen characterizes both the heroin addict and the victim of his criminal activities as the joint victims of corrupt governments and social orders which enjoy economic benefits provided by the illicit drug industry complex. Karmen's paper can be read with profit even by those who do not subscribe to his political views, primarily for the insights it provides into the complex symbiotic relationships among the various legal and illegal components present in any society.

PRECURSORS AND PREDICTORS

Can we predict drug addiction before it starts? Theories of the etiology of addiction provide ways of explaining or understanding what has happened. However, such theories do not necessarily enable us to make accurate predictions about the incidence of new cases. On the other hand, the search for predictive factors may or may not be related to any particular theory of addiction. Predictions are concerned with results, not with comprehensiveness or conceptual elegance. Nonetheless, science seeks a compromise between theory-building and prediction: the most satisfying theory is the one which specifies or anticipates the most practically useful predictors.

In the past, much predictive research in the field of drug addiction has hardly even been labeled as such. The "predictive" aspect has been implicit rather than explicit, and the research has used geographic areas, socioeconomic classes, or even entire societies as the unit of analysis. We refer here to the numerous studies documenting the incidence of narcotic addiction to be much higher in inner-city poverty areas than in more affluent communities, to be higher among the lesser educated than among the more educated; and to be more common under a permissive cultural ambience than under an authoritarian one. However useful and valid such findings may be from a broad, social-theory standpoint, they are still of limited utility in dealing with the individual case. Also, they promote stereotypical thinking with respect to the populations involved. Clearly, the unit of analysis should be much smaller and more discrete—certainly no larger than the neighborhood, preferably no larger than the family unit, and ideally focusing on the individual.

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[10] See Lee N. Robins' "Addict Careers," this volume.

Family Influence

If we are trying to predict drug abuse (or its absence) at the individual level, a number of different indicators may be useful. As noted in the discussion of the role of the family earlier in this paper, young people who come from intact families which emphasize traditional values and virtues appear to be at a decidedly lesser risk of addiction than are persons who come from single-parent families having less rigid convictions and more opportunistic lifestyles. Moreover, parents who accept or approve of drugs apparently transmit these attitudes to their children. Children of alcoholic parents appear to be at special risk, perhaps by nature as well as by nurture (Goodwin et al. 1973).

Patterns of Deviance

Of all predictors at the individual level, the most potent are those that establish a pattern of deviance from a relatively early age, often beginning in elementary school. Moreover, it appears that the earlier the onset of the deviant behaviors, the more malignant the process involved and the more ominous the prognosis. This is especially true with respect to narcotic addiction—the younger the age at onset, the more intense and committed the addictive career (Lukoff 1974). Moreover, a study of childhood deviance among urban black males found that opiate use was almost always preceded by early sex experience, marihuana use, and dropping out of high school (Robins and Wish 1977). In addition, the developmental process appeared to be in large measure "quantitative" in that the number of previous deviant behaviors made the largest contribution to the prediction of subsequent specific deviant behaviors. Stated another way, a syndrome of deviancy appears to be in operation: the specific deviant acts, any one of which may or may not be engaged in by the individual, are mere facets of an overall pattern whose severity may be gauged by the sum total of such acts.

Antisocial Behavior

A closely related study of this same group of subjects found that antisocial behavior in childhood is especially important (Robins and Ratcliff 1978). Childhood antisocial behavior was associated with a 50 percent risk of serious antisocial behavior as an adult. However, absence of childhood antisocial behavior was an even more powerful predictor, ensuring the absence of later antisocial behavior in adulthood in 92 percent of the sample. In addition, three childhood family variables were identified that made a substantial contribution to predicting adult antisocial behavior (including drug abuse): (1) being placed in a residence away from both parents, (2) extreme poverty, and (3) growing up in a family lacking parent figures of both sexes. Having an antisocial father was also a powerful predictor of adult antisocial behavior, whereas lower social class status per se made little contribution as an explanatory variable.

This study also found that childhood antisocial behavior was a potent predictor not only of later alcoholism but also of drug abuse. Early drug use was the childhood behavior with the most striking predictive power; it was almost always followed by a high level of adult behavior problems.

Similar findings have been reported by the Arlington Youth Study (Gelineau 1972a). Less than 2 percent of students with mostly "A" grades used drugs, whereas nearly 75 percent of students with mostly "D" grades did so. Moreover, drug users were far more immoderate in their use of alcohol, and they were much more heavily involved in shoplifting and other forms of crime and deviance than nondrug users. A similar study of Lowell students (Gelineau 1972b) reported that drug users were much more likely to come from single-parent families, to not attend church, and to use alcohol excessively than were nondrug users. As noted earlier, such correlations with drug abuse may become attenuated as the behaviors in question become less culturally deviant.

Genetic Factors

Nearly all of the above precursors have traditionally been classified as social-environmental variables. This implies that drug abuse is determined by the individual's environment, and there can be little doubt that environmental factors play a crucial role. However, other factors may also come into play. Indeed, there is an increasing body of evidence suggesting that genetic factors may have an important role in alcoholism and other forms of deviant and antisocial behavior (Crowe 1972, Goodwin et al. 1973; Miner 1973; Rimland 1969) and may have such a role in drug abuse.

Only a small percentage of those who experiment with narcotics ever become full-fledged addicts in spite of unfavorable environmental pressures. Thus Dole (1977) has stated his belief that a specific biochemical abnormality will be discovered among addicts.

In any case, we can no longer ignore the possibility that nonenvironmental factors, genetic and biochemical, may play an important role in the etiology of addiction, as in other forms of deviance. A comprehensive approach to both prevention and treatment requires that such factors be given due consideration.

CONCLUSIONS AND RECOMMENDATIONS

While it is evident that much has been learned regarding drug abuse, it is equally clear that much remains to be understood, especially in the area of etiology. Therefore, instead of merely summarizing the topics covered in the preceding sections, an attempt will be made to draw the logical implications of this diverse material in the form of a series of recommendations in each of four general areas: research, prevention, treatment, and education-training.

Research

The very fact that so many different theories exist regarding the etiology and maintenance of narcotic addiction is testimony to the fact that no existing theory is sufficient to account for the variety of phenomena involved. Although many of these theories may be partially valid, there has, as yet, been no comprehensive integration of the known facts into an all-embracing theoretical network. Perhaps the time has come for such a comprehensive integration to be formally attempted, for the availability of such a general theory would provide greater guidance for research and promote rationally based inquiry rather than fragmented, unrelated, and empirically oriented investigations. Somehow, explanations at the various levels (societal, community-wide, familial, and individual) must be merged, as must the contributions of the relevant disciplines (demography, sociology, psychology, genetics, and physiology, among others).

At the more concrete, practical level, an attempt should be made to develop a high probability drug risk profile consisting of personal and social characteristics that could be applied and tested experimentally with young deviates at both the juvenile and criminal court levels (Robins and Wish 1977; Nurco 1972). Moreover, since many addicts do use voluntary services after addiction but not appreciably before, it would seem appropriate to study ways of effectively reaching out to this population before they become addicted.

Prevention

It is clear that effective prevention must be grounded in solid facts derived from research. As noted earlier, however, it now appears possible that many "high-risk" individuals can be identified even at the elementary school level. Although much information is still lacking and our methodologies are still relatively crude, young persons identified as being at high relative risk for subsequent narcotic addiction could be singled out for priority services and special help and treatment before the progression toward addiction becomes unalterably fixed. Such identification might take place within the school setting and/or in the course of contacts with the juvenile court; the important thing is that the full weight of the therapeutic armamentarium should be brought to bear on such high-risk individuals before addiction takes place.

Treatment

Treatment is a topic surrounded by controversy that can only be resolved through careful research and evaluation. For this reason, rather than making a blanket recommendation in favor of one or more intervention strategies, we would advocate the creation of special centers for research and treatment, "centers of excellence" that would be staffed by highly competent professionals who would be devoted to the development and evaluation of new strategies and who would teach new and proven techniques to field workers associated with schools, the juvenile courts, hospital emergency services, and any other agency with which high-risk juveniles are likely to come in contact (Nurco et al. 1971). Theories and methods of drug abuse treatment must be subjected to rigorous, preferably comparative evaluation so that limited resources do not continue to be expended in relatively fruitless treatment endeavors (Eisenberg 1977). Moreover, we would do well to define effective treatment in this context as the prevention of the preaddict juvenile's attaining the next stage in the progression to full-fledged addiction. Even if such prevention is not wholly successful in many instances, it may still be possible to provide training in practical skills or trades so that the individual would have, at age 30, some alternative to a continued career in addiction (Nurco 1972).

Education and Training

Although evidence of efficacy is still lacking, it would nonetheless seem desirable for school children to be taught about the social problems associated

3-7

with drug and alcohol dependency. Moreover, such education should stress the subtle, long-term effects of drug and alcohol abuse on both physical and social functioning. Emphasis should also be given to the positive concept of the individual's responsibility for his own behavior. At the same time should drug abuse become too widespread, the danger of an overcontrolled society should be noted, with the concomitant possible loss of individual freedom within that society. In this connection, it should be possible to provide students with information concerning both the positive and negative uses of drugs in contemporary society, so that after being confronted with the opportunity to use them, their choice in this regard would at least be an informed one.

Meanwhile, professionals in various fields—education, medicine, law, social work—should be better trained and better equipped to recognize and to deal with the type of person who is prone to use drugs as a crutch, as well as to identify the illegal drug user in his early stages. As noted in the preceding section, such training could best take place within the context of a special center for research and treatment perhaps modeled after the university teaching hospital. In such a setting, the gap between research and application could be minimized (Eisenberg 1977) as field workers would be kept abreast of the latest theoretical and scientific developments while they, in turn, would provide information concerning the most recent community trends. Only by means of such a close interaction between research and practice, between theory and application, can we expect a reversal of the current grim statistics of narcotic addiction.

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31. Addict Careers

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Other chapters in this volume have discussed the reasons why some individuals begin using heroin and have also considered the question of whether or not treatment for addiction is effective. This chapter will deal with the question of how the heroin user becomes an addict, what being an addict means in terms of the frequency and amount of use of heroin, the physical and social problems that seem to be a result of heroin addiction, the entry of the addict into public statistics, the frequency with which s/he enters the treatment process, the frequency with which s/he interrupts the use of heroin spontaneously or in treatment, the frequency of final remission, and the persistence of postaddiction problems that may be the result of the addiction.

BECOMING AN ADDICT

For many years, it was assumed that anybody who used heroin more than a very few times would inevitably become addicted. In recent years, this assumption has been challenged, based on the discovery of individuals who for some period of time have been using heroin, but whose use has been sufficiently spaced to avoid addiction. One difficulty with accepting these cases as evidence that regular heroin use need not necessarily lead to addiction is that unless one follows such individuals until they stop using heroin or die, one cannot be sure that they are not en route to addiction, perhaps only more slowly than most users. Another difficulty is that the investigator never knows the amount of heroin consumed. Given the heavy dilution of illegally purchased heroin, doses may be homeopathic.

It would be helpful in overcoming the first difficulty, that the unaddicted user may be en route to addiction, if we could compare the length of time nonaddicted users have been using heroin with some regularity to the usual interval for addicts between onset of regular use and the onset of addiction. If "chippers" have used heroin for a period considerably longer than that reported to precede addiction by those who did become addicted, perhaps they may be able to continue use indefinitely without addiction. Unfortunately, most studies reporting on nonaddicted heroin users do not include this information. For instance, Levengood et al. (1973), studying 60 young middle-class heroin users, found 31 who had never been addicted. However, since the average age of the subjects interviewed was only 19, more are likely to become addicted later if they continue use. They did, however, find some in their never-addicted group who had been using heroin occasionally for more than a year, indicating at least that addiction need not always occur rapidly. By advertising in the newspaper, Powell (1973) found 12 individuals who had been using heroin occasionally for at least 3 years without addiction. All were in their twenties at interview, and thus still at risk of addiction. Since neither of these studies provided a random sample of users as a base, it is not possible to estimate from them how many heroin users can continue use without addiction.

The only study that provides addiction rates in a national random sample of heroin users is by O'Donnell et al. (1976). Since they began with a random sample of the young male population, the heroin users identified within that sample also constitute a random national sample of young male heroin users. Even this study, however, has the drawback of being a cross-sectional study of men who are still

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young. This study found that among young men who had ever used heroin, about one-third had at some period used almost every day. This indicates that occasional heroin use is considerably more common than addiction. However, among those reporting that they had used heroin as much as once a month, daily use occurred in 70 percent. And among those who used not only once a month but sometimes heavily, the proportion of daily users rose to 97 percent. These figures indicate that the only regular users who do not become addicted are the few who limit their use to small amounts of the drug.

Our best estimate as to the length of the typical interval between use and addiction comes from studies of addicts who were asked both when they first used heroin and when they first became addicted to it. The difference between those dates provides an estimate of the usual interval, although not a precise one, since the discovery that one is addicted may not occur for some time after the onset of the addiction. Most such studies find a mean interval between 5 and 18 months, and considerable variation from individual to individual. Waldorf (1973), for instance, found a median interval of 11 months, but the time could be as brief as 3 weeks or as long as 6 years. Halikas et al. (1976) found an average interval for black inner-city addicts of approximately 18 months. Blumberg et al. (1974) found an interval of about a year between first and regular use for English addicts. Hendler and Stephens (1977), interviewing 30 addicts in a New York City drug treatment program, found that somewhat less than a year was the average interval, but that some users reported addiction from their very first experience.

In Vietnam, half of those who tried heroin did not become addicted to it (Robins 1974). However, many of those who remained unaddicted had tried it only once or twice. Among those who had tried it at least five times, 73 percent became addicted, a figure similar to that found by O'Donnell et al. for regular users. Among veterans who used heroin after Vietnam, the rate of addiction was much lower: only 28 percent of those who used in the first 10 months after return (Robins 1976) and only 25 percent of those who used during the second or third years after return from Vietnam (Robins et al. 1977). While this study does not provide an exact answer to the interval between first use and addiction, it does show that the proportion of heroin users who became addicted varied with the setting. The higher rate of addiction in Vietnam may have been due in part to the better quality of the drug and more frequent use because the drug was less expensive and more available. Such factors may also explain differences within the United States in different areas and different localities.

The proportion of addicts among users may also vary with changes in the kinds of people who use heroin. As the public has begun to learn that it is possible to use heroin occasionally without becoming addicted, more cautious people have probably tried it, thus helping to substantiate this new belief.

In this country, the first use of heroin is either by injection, reported as the method of first use by 86 percent of addicts in the California Civil Addict Program[1] or by snorting (Waldorf 1973). In Vietnam, it was smoking a mixture of heroin and tobacco or marihuana (Robins 1973). In Vietnam, injection occurred almost solely among addicts, but was not universal even among them. In the United States, Hendler and Stephens (1977) report that almost every addict was already injecting by the time he became addicted. This change from snorting to injection may account for the fact that one-quarter of the addicts they studied became addicted without ever having increased their dose. As the user shifted from snorting to injection, he was in fact absorbing more of the drug even though the dosage was constant.

If it is possible for some people to use heroin without becoming addicted, it would be very useful to know who is and who is not relatively immune, in order to warn those at high risk. Unfortunately, we know very little about who can and cannot use safely. The familiar social variables associated with addiction (minority ethnic group, male, young, urban, delinquent, high school dropout) are probably more predictors of use than predictors of addiction among those who use. Waldorf (1973) found that female addicts came from worse home backgrounds than did males, suggesting that being female may protect against addiction. However, we do not know whether the reason for this difference is that it takes a worse background for a woman than for a man to experiment with heroin or that, when men and women both experiment, women are less at risk of addiction.

Robins (1976) found that the factors predicting which heroin users in Vietnam would become addicted were different from factors predicting which of those continuing use after their return would become addicted in the United States. In Vietnam, being a young, black user predicted becoming addicted, and parents' problems were unimportant. After Vietnam, those users most likely to become

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[1] W. H. McGlothin 1978: personal communication.

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dependent were demographically unusual users: those white and older, and particularly those with parents who were alcoholic or arrested.

HEROIN DOSAGE OF ADDICTS

We know remarkably little about how much heroin addicts actually do consume or would consume if heroin were freely available. Since heroin is a short-acting drug, addicts require a dose every few hours to avoid withdrawal. Its high price has tended to limit its use to amounts necessary to get high or avoid withdrawal. Observations similar to those conducted with alcoholics (Mello and Mendelson 1972) and with marihuana users (Rossi et al. 1974) and heroin addicts (Mirin et al. 1976) would enable us to learn the spontaneous timing and dosages among habituated users when heroin is free or can be earned by simple tasks in the laboratory. Since there seems to be an upper limit to the degree of physical dependence on opioids, as shown by the fact that dosages beyond 500 mg of morphine per day are not associated with greater severity of withdrawal syndrome (Jaffe 1975), there may well also be a "natural" upper limit to the heroin dosage voluntarily sought, as there is for alcohol and marihuana, as well as a monetary limit.

THE COMPLICATIONS OF ADDICTION

One way to estimate the adverse effects of addiction is simply to ask addicts what problems drugs have caused them. The difficulty is that they may not be able to answer that question accurately. Although an addict can identify arrests for possession of a hypodermic needle as an unequivocal effect of his/her addiction, s/he cannot be sure to what extent other arrests may have occurred because the police were keeping him/her under surveillance as a known drug user. Nor can the addict be sure that health problems (other than abscesses at the site of an injection) are due to addiction, nor that marital difficulties can be attributed exclusively to drug use, particularly if the addict has engaged in a variety of other deviant behaviors that might well lead to marital breakup.

An alternative to asking the addict's opinion about the effect of drugs is to compare rates of various social and medical problems in addicts with rates in the general population. While this avoids depending on the addict's insight, there are other difficulties. People addicted to heroin are different in many ways from the average citizen, even before they begin the use of heroin. Thus, there is always a question about the proper control group with which to compare heroin addicts. Another difficulty is that many of the possible complications of addiction, such as crime, unemployment, and marital problems, rather than being entirely the result of addiction, may be the very source of psychological stress which first encouraged the addict's persistent heroin use. Thus the causal relationship between maladjustment and heroin addiction is not necessarily unidirectional; there is likely to be a reciprocal relationship or vicious circle.

These difficulties in choosing a proper comparison group and disentangling effects from causes of addiction have led to many arguments about the interpretation of data. There is no doubt that many health and social problems are more common in heroin addicts than in the general population. The question is to what extent addiction is their cause. The complications we will explore are death, illness, psychological symptoms, crime, marital breakup, and unemployment.

Deaths

Death rates among heroin addicts are a great deal higher than rates in the general population of men in that age range. The excess deaths are attributed chiefly to drug overdose (Cherubin et al. 1972) and to suicide, accidents, and homicide. DuPont (1976) has pointed out, however, that many of the deaths of heroin addicts are probably not caused by the heroin itself but by the drugs used to dilute it in the street market. Where autopsies of unexpected deaths reveal heroin in the body or fresh injection sites with no other apparent cause of death, it is common practice for medical examiners to attribute the death to heroin. The difficulty is that heroin addicts chronically have heroin in their bodies and recent injection sites, and these facts may have been irrelevant to the death. Suicide has been estimated to occur in 10 percent or more of drug addicts by Miles (1977). Sells et al. (1972) underscored the high risk of death from violence among addicts.

Illness

There is little evidence that any opioid, including heroin, causes physical illness. Indeed, methadone has been given in large daily doses for more than 8 years without evidence for direct injurious effects (Jaffe 1975). Nonetheless, in interviewing a series of addicts, Waldorf (1973) found that half of them said that their health was "not too good." It is not known to what extent this is due to the heroin directly, to the high cost of heroin's leading to poor diet, or to the fact that heroin analgesia prevents the addict's paying sufficient attention to intercurrent illness.

It is clear, however, that the nonsterile needles used for injection often cause abscesses and communicate serum hepatitis. DuPont (1976) has pointed out that most of the hepatitis cases occur within the first or second year of use. Perhaps the period of early use is associated with more communal administration of drugs, or perhaps most addicts get serum hepatitis early and are subsequently immune.

Psychological Problems

Psychological problems have been viewed more often as the cause than the consequence of heroin addiction. This view stems from studies in which addicts who were asked why they used heroin in the first place, or why they relapsed to it, mentioned the desire to escape from problems or to relieve anxiety. However, there are some indications that heroin addiction can also cause psychological problems. When Robbins and Nugent (1975) asked addicts treated in the Veterans Administration what problems heroin had caused them, both depression and anxiety were mentioned as consequences. Among Vietnam veterans, men who relapsed to heroin shortly after return more often developed depressive symptoms later than did men who abstained from heroin in the early period, suggesting that using heroin may have led to their depression (Robins et al. 1978).

Crime

The question of the extent to which heroin addiction contributes to crime has engendered much discussion. Some believe the association between crime and heroin use is entirely explained either by the fact that criminals are especially vulnerable to addiction or by the fact that without arrest for a crime, addicts would not come to public attention or be referred to treatment. Some who concede that addicts steal to support their habits blame this entirely on the illegal status of heroin, which forces its price up. The British system, which offered addicts medical prescriptions for heroin, was based on the latter assumption. The British discovered, however, that even under the prescription system, there was a high rate of criminality among heroin addicts (Hawks 1974). British addicts also continued to buy illegal drugs, not satisfied with the amounts available to them by prescription. While the British findings tend to discount the argument that it is entirely the illegal status of heroin that accounts for its association with crime, they would be compatible with the hypothesis that people who become addicted are highly disposed to criminality even before their use of drugs, and that the observed association between drugs and crime is therefore spurious. Lukoff (1974) pointed out that many addicts had been arrested before beginning daily drug use, and that drug treatment, with its associated decline in criminality, often takes place at the age when criminality normally declines spontaneously in nonaddicted criminals. These observations are important; yet recent studies have shown that the rate of crime does increase with the onset of addiction (Nurco and DuPont 1977) and fluctuates with the amount of heroin being used (McGlothlin et al., in press). There remains the possibility, of course, that whatever determined the level of heroin use during a particular period might also determine the level of criminality, making the correlation spurious even when use and crime fluctuate together. However, this seems highly improbable, given heroin's expense. Silverman and Spruill (1977) have shown that the price of heroin and the amount of crime in the community vary together, which argues for a direct relationship between the use of heroin and crime. Even the upper-class addicts studied by Levengood et al. (1973) had all sold drugs in order to support their own use.

Crimes that increase with addiction, in addition to selling drugs, are principally forgery, conning, sex crimes, and theft (Biernacki 1973). There seems to be very little increase in violent crime as a result of addiction (Nurco and DuPont 1977). It has been noted that women addicts steal less than addicted men because they can relatively easily make money through prostitution. A high rate of prostitution was found both among arrested female addicts (Weissman and File 1976) and among female addicts in treatment (Chambers and Inciardi 1971).

Thus, while it is true that the kinds of people who use heroin are also likely to commit crimes, and that committing crimes makes them especially likely to come to public attention as addicts, the fact that the number of property crimes does seem to fluctuate with the use of heroin makes it highly probable that addiction does directly increase the frequency of theft and other crimes designed to provide money for drugs.

Marital Breakup

The evidence for the role of heroin in marital breakups is only indirect. However, every study finds that addicts have a very high rate of marital instability. It is easy to understand why this should be so, since not only are addicts unable to support a family when they are spending most of their money on heroin, but heroin also clearly interferes with the sexual performance of males (Cicero et al. 1975). Older addicts in particular are almost entirely divorced, separated, or single (Capel et al. 1972).

Unemployment

The arguments about unemployment have paralleled those about crime. Addiction typically begins when men are young and inexperienced in the job market. In addition, they are frequently high school dropouts with virtually no skills to offer. It would not be surprising to find a high rate of unemployment in such a population, regardless of their drug use. But in addition, most addicts report that addiction caused them job troubles directly (Robbins and Nugent 1975). Evidence for the correctness of their self-report was found by McGlothlin et al. (1977) in a study of addicts referrred to the California Civil Addict Program. Fewer addicts held jobs while using heroin than they did during abstinent periods. As one would expect, given the facts that lack of education and job experience makes addicts eligible only for low paying jobs, and that their addiction makes them likely to be absent from work and thus susceptible to being fired, addicts are an impoverished group. In a study of Baltimore registrants on the Maryland Narcotics Addict Register, Nurco and Farrell (1975) found 85 percent classifiable as indigent, based on their eligibility for Medicaid, receipt of public assistance, or residence in an officially designated poverty area.

The Causal Role of Heroin

In an effort to learn the extent to which the clear social disadvantage of addicts is due to their use of heroin, rather than to their preexisting characteristics or to the variety of other drugs that they are commonly involved with, Robins et al. (1977) have matched Vietnam veterans who used heroin regularly after their return from Vietnam with other veterans who used no heroin but did use the same other drugs as the heroin-using veterans and who also had the same kinds of childhood histories. Comparing the adjustment of these two groups with respect to marital breakup, unemployment, heavy drinking, violence, and arrests made it possible to learn whether the use of heroin made an additional difference. An increase in adjustment problems was found among the heroin-using group, an increase that was not explainable by early history or concurrent multiple drug use. However, it is noteworthy that the regular use of heroin produced no more social problems than did the regular use of amphetamines or barbiturates studied in the same way.

THE HEROIN ADDICT AS A POLYDRUG USER

We mentioned above that it was necessary to control on the number of other drugs that heroin addicts used before assuming that social problems might be the effect of heroin. There is now ample evidence that heroin addicts have almost all been heavy users of tobacco, alcohol, and a variety of illicit drugs (Platt and Labate 1976). What is less clear is how the use of these other drugs is temporally related to heroin addiction. Until that is known, we cannot begin to understand to what extent heroin addiction causes or is caused by the use of other drugs.

Surely only drugs that are added after heroin can be considered in any sense as due to the heroin experience. The only drug regularly found to be started later than heroin is cocaine. Three studies found that when addicts also used cocaine, the use of heroin typically preceded the cocaine use (Bewley and Ben-Arie 1968, Gould and Kleber 1974; O'Donnell et al. 1976). Thus cocaine is the only drug the use of which may be a consequence of heroin addiction. However, the order in which drugs are used is as likely to reflect the historical era of use as any causal relationship. In an early (1965-1966) study of black men born in the 1930s, Robins and Murphy (1967) found that use of amphetamines usually followed the use of heroin, rather than preceding it as more recent studies have found. This was because the sample began heroin use between 1950 and 1952, when amphetamines were just beginning to enter the illicit market. They had had no opportunity to use them before beginning heroin. Today, cocaine may be the drug increasing in availability.

Whatever the sequence, it is clear that heroin addicts do use many other drugs and that beginning heroin use is rarely followed by a marked decline in the use of other illicit drugs. For instance, Vietnam veterans who had been addicted in the last 2 years averaged the use of 10.4 other drugs in that same period, while those regular but nonaddicted heroin users averaged only 7.9 (Robins et al. 1977). Almost every Vietnam veteran addicted to heroin in the last two years (95 percent) had also used marihuana heavily during the same period. Waldorf (1973) and Raynes et al. (1974) also found that marihuana use continued along with heroin addiction.

The only drug for which there seems to be clear evidence of a dropoff in use during periods of addiction is alcohol. Although a very high proportion of heroin addicts have had problems with alcohol, drinking seems to decline during the addicted period and rebounds during periods of treatment on methadone or during periods of remission (Waldorf 1973; McGlothlin et al. 1977).

ON BECOMING AN ADDICTION STATISTIC

Addicts usually come to public notice in one of three ways: through arrest for drug possession, as a result of entering treatment for drug use, or as a result of death from drug overdose. Questions that have puzzled many researchers are (1) what proportion of addicts eventually come to public notice, and (2) how long it usually takes after addiction begins for the individual to appear in some official register. If we knew those two figures, it would be possible to make a reasonable estimate, based on proper weighting of those who have entered our arrest, treatment, and death statistics, of how many addicts there are in the whole population. Not only are these figures hard to acquire, they remain valid for only a limited time. The number of places available in treatment facilities, legal requirements for a minimum duration of addiction before being eligible for certain treatments, the frequency with which autopsies are performed, the number of police assigned to drug control, and police department policy with respect to arresting addicts or only major dealers in narcotics all influence both the number of addicts eventually identified and the speed with which they become known.

It is not difficult to find addicts who have not come to public notice. For instance, Blumberg et al. (1974) found that addicts coming to treatment reported no treatment experience for about half of their addicted friends. Halikas et al. (1976) were able to obtain a sample of never-treated addicts by asking those in treatment to bring in such friends. The finding of unidentified addicts in cross-sectional studies does not tell us whether any addict escapes public notice forever. Indeed, the Halikas study found that the friends who had not been in treatment were approximately 2 years younger than the addicts new to treatment, suggesting that it might only be a matter of time until the friends would also enter treatment.

The interval between first becoming addicted and entering treatment varies from study to study. In Chambers' (1974) and Halikas' (Halikas et al. 1976) studies, the interval between addiction and treatment was about 6 years. But Chambers pointed out that the interval seems to have been dropping as more treatment facilities have become available. In England, when regulations requiring public notification of treatment of heroin addicts were issued, the interval was only about 2 years (Hawks 1974).

The interval between addiction and becoming known as an addict by the police also varies a great deal. In the Halikas study, the interval between addiction and first drug arrest was short, only half a year. Among addicts known to the police (Nurco et al. 1975) the average interval between first regular use of heroin and becoming known to the police was about 5 years. The few studies comparing men and women (Chambers 1974; Rosenthal and Bardine 1976) agree that women tend to come to attention more rapidly than do men.

THE TREATMENT EXPERIENCE

We will not discuss the effectiveness of treatment, since that is a topic for another chapter. However, we will describe the typical length of treatment and the number of times that addicts enter treatment.

The length of treatment is set by law in civil commitment procedures, and other programs may recommend standard durations. Therefore, one cannot use completing treatment as any indication of how long it takes to cure addiction. Indeed, a recent followup study indicated that cure rates are unrelated to treatment duration (Burt Associates 1977). A study of treatment durations, then, only tells us something about professionals' beliefs about how long it takes to cure addiction, and tells us how often patients are willing to cooperate with these beliefs.

Waldorf (1973), in studying the civil commitment system in New York, found that inpatient treatment usually lasted 9 months out of the 3 years in which the addict had to be under supervision. In the California Civil Commitment Program (McGlothlin et al. 1977) the median length of first inpatient period has dropped from 15 months to 6 months. In therapeutic communities, the prescribed treatment regimen is often 2 years or longer, although few addicts stay the full prescribed period.

In contrast to these protracted treatments, treatment in the Veterans Administration hospital is often extremely brief. Robins (1975) found the average duration for Vietnam veterans in a Veterans Administration hospital had been only 2 weeks, even among those who did not report leaving against medical advice. Only a very few veterans remained as patients for several months.

Short or long, entry into treatment is usually a recurrent phenomenon. Sells et al. (1976) found that 61 percent of all patients returned to treatment during the posttreatment followup period. Waldorf (1973) found that half of all addicts in treatment under the New York Civil Commitment Program were in their second or higher treatment experience, and a fifth had been in treatment at least four times. O'Donnell et al. (1976) and Robins (1975), each studying unselected samples of young men, one sample from the general population and one from Vietnam veterans, both found a 35 percent reentry rate among those who had ever had treatment.

These studies agree that reentry is common, but none has yet determined how many treatment episodes the typical addict can expect to undergo in a lifetime, nor how long s/he can expect to remain out of treatment between admissions.

RELAPSE

Multiple treatments imply high degrees of relapse on release from or departure from treatment. Hunt and Bespalic (1974) found that the relapse almost always occurred in the first 3 months, with a rapid decrease in the risk of relapse thereafter, so that almost all relapses that would occur had occurred within 6 months after treatment. Stephens and Cottrell (1972), following 200 treated addicts from Lexington, found that 87 percent of them began using again within 6 months, and 65 became readdicted. These rates were even higher for the younger addict. Those under 30 became users again in 89 percent of the cases and were readdicted in 70 percent.

O'Donnell et al.'s national sample (1976) included 20 men who had been treated for heroin use. Half of these (10 men) relapsed within 1 month of treatment, and 85 percent (17 men) relapsed within 4 months. Robins (1975) found the same high rate of relapse for Vietnam veterans treated in the Veterans Administration hospitals that other treatment studies report for nonveterans. Only 28 percent did not return to heroin after treatment. Within 3 months, 44 percent had used heroin, and indeed 19 percent relapsed on the very day they left treatment.

Studies agree not only that relapse is common, but also that its best predictor is the absence of a job before and during treatment (Stephens and Cottrell 1972; Vaillant 1970). Being young, black, and single, having little education, and having heavy involvement in heroin and in the heroin subculture also contribute according to some studies. It may be that these traits cause relapse because they are associated with reentry into a community in which drugs are readily available.

PERIODS OF TEMPORARY VOLUNTARY REMISSION

Temporary remissions often occur without treatment. Indeed, heroin addiction has a fluctuating course, with many periods of remission and relapse. It would be interesting to know how often these remissions are truly spontaneous and how often they are a response to unavailability of the drug in a local market, incarceration, parole, hospitalization, or drug treatment. Certainly incarceration plays an important role in forcing remission upon addicts. In the followup of addicts known to the police (Nurco et al. 1975) and in the study undertaken by Ball and Snarr (1969), a large proportion of those abstinent were abstinent because they were in jail.

One study that may be able to produce an answer to the question of how often remission is truly voluntary is a study by McGlothlin et al. (1977) of California Rehabilitation Center (CRC) cases. This study has already provided an approximate answer. The untreated comparison group (i.e., those released on a writ after being sent to CRC for treatment) used narcotics daily for 37 percent of the time they were not under supervision as patients or convicted persons. Unfortunately, temporary and permanent remissions are merged in this figure, so we cannot tell how much of this two-thirds of the total period in which the comparison group was free of addiction represents recovery and how much represents spontaneous temporary remission.

Studies of addicts currently in treatment avoid this problem since by definition none is in permanent remission. Halikas et al. (1976) found that for inner-city addicts in treatment, the longest reported period off heroin averaged about 27 weeks, including any period in which they were off because of prior treatment. The intervals off heroin were shorter for those who had never entered treatment, 20 weeks, but as noted above, those who were untreated were also 2 years younger than the treated addicts and so had a shorter period during which they might have stopped using heroin. Levengood et al. (1973) found among his upper-class addicts that 9 out of 31 had been off heroin for at least a month without any treatment. DeFleur et al. (1969-70), in interviewing 53 narcotic addicts from Lexington, tried to estimate how many of them had dropped their addiction voluntarily. They found that about half (47 percent) had been off heroin voluntarily for at least 6 months by the time they came to treatment. They estimated that addicts spent three-fifths of their time actively addicted, one-fifth voluntarily abstinent, and one-fifth abstinent because they were in prison. Waldorf (1973) found that more than half of the addicts civilly committed in New York had had at least four periods of voluntary abstinence lasting more than a week. Forty percent had had a period of more than 3 months of voluntary abstinence, and 21 percent a period of at least 8 months. It is clear, therefore, that the natural history of heroin addiction is one of frequent passage into and out of active addiction.

There have been some efforts to study the reasons that people move into and out of addiction with such frequency. Brown et al. (1971) interviewed a series of patients in the Narcotics Treatment Administration in Washington, D.C. about their reasons for remission and their reasons for subsequent relapse. The major reason offered for undergoing the first voluntary withdrawal was an effort to change their life pattern. The next most common reasons were that drugs were too expensive, had hurt their health, and that their families had urged them to do it. Vietnam veterans who had not been addicted in the second and third years after Vietnam, and had not used any heroin in the last 2 weeks before interview were similarly asked their reason for quitting (Robins et al. 1978). The most common reason offered was that heroin was too expensive, and next, that it was too hard to get. The next most common reason was a preference for alcohol over heroin. The remaining reasons were similar to those obtained by Brown et al. (1971): that the family had urged it—10 percent, that it hurt their health—10 percent, that they feared arrest—10 percent.

These explanations are not entirely convincing. They seem to say, principally, that the reason for quitting is wanting to. Yet one theme that does seem to come through is a desire to avoid the "hassle" of maintaining a heroin supply. Maintaining that supply and earning or stealing funds to maintain it are both strenuous activities which older addicts weary of.

Brown et al. (1971) also inquired of men who had withdrawn and then relapsed why they went back to the drug. The most frequent explanation was that they felt a need for it, that is, they were still addicted psychologically even if not physiologically. Thirty-nine percent gave this reason. The next most common explanations were that heroin was easy to get, that it helped them with personal problems, that their friends talked them into it, or that they were dissatisfied with treatment. Stephens and Cottrell (1972) also asked men who relapsed to heroin after treatment why they had done so. Their answers were very similar to those obtained by Brown et al. About half said that they had a craving or just wanted it. About a quarter said they did it to alleviate stress, and about a quarter to combat depression or faults that they had or felt they had.

It is difficult to understand why men should suddenly want heroin again after a period of remission of several months in which they have had ample time to recover from the pains of withdrawal. An interesting theory has been proposed by Wikler (1973). He believes that relapse is a conditioned response provoked by revisiting scenes and persons associated with withdrawal. In the absence of treatment to extinguish this response, he thinks relapse can occur long after physiological withdrawal symptoms have abated.

Before leaving the topic of spontaneous remission and relapse, it is important to note that addicts' relapse to heroin use does not necessarily mean relapse to addiction. Among men who had been addicted in Vietnam (Robins et al. 1977), 56 percent abstained from heroin entirely after their return. Thirty-two percent, however, did go back to using heroin but without becoming addicted to it. Only 12 percent became readdicted. While it is reassuring that relapse to occasional use need not lead to readdiction, this finding has little practical application at present because no predictors were found that could discriminate men who could use again without becoming readdicted from those who could not.

THE TERMINATION OF ADDICTION

The high rate of relapse after treatment and voluntary abstention would seem to suggest that heroin addiction is an extraordinarily intractable condition. Yet heroin addicts coming to public attention are predominantly young (Ball and Chambers 1970), which suggests the opposite: Recovery must be common unless most addicts die young or become inconspicuous with aging.

Although the death rate during addiction is high, it alone could not account for the youthfulness of the addict population. And while older addicts do seem to reduce the amount and regularity of their heroin use (Stephens and Cottrell 1972) and thus may become less conspicuous as they have less need for criminal activities to support their smaller habits, these differences again seem insufficent to explain the marked youthfulness of arrested and treated addicts. Indeed, interviews with ex-addicts (Brill 1972) show that the temporary remissions described above get longer over time and finally eventuate in the addicts becoming heroin-free before most reach middle age.

A study by Nurco et al. (1975) suggests that addiction ends for a very large majority of those who survive. In his followup of men known to the Baltimore police as addicts, only 7 percent were currently using daily at the time of interview. This figure varied little by cohort, suggesting that the decline to 7 percent occurs after only a few years of addiction, and that little further reduction occurs thereafter. McGlothin suggests another interpretation, however. This low rate may be accounted for by an equal reluctance of all cohorts to reveal current use even when they are candid about use in the past.[2]

The study by O'Donnell et al. (1976) further supports the view that recovery is nearly universal. Only about 4 percent of this national sample of young men who reported having ever been daily users of heroin had used in the 24 hours prior to interview. Similarly, the study of Vietnam veterans (Robins et al. 1977) found that 88 percent of those addicted in Vietnam had not been addicted at any time in the 3 years following their return, and that of those who had been readdicted in the first year back, 70 percent were not readdicted at any time in the following 2 years.

Given the fact that heroin addiction does terminate for almost all, it would be useful to know its usual duration. Brill (1972), in studying former addicts, found that the average period from first to last use was about 9 years. The range was 4 to 21 years. These figures include the time from first use to last use rather than the period of daily use or addiction. If one subtracts out the 1 year that has been reported as the average duration of time from first use to addiction, the median duration of the addiction would be about 8 years. This estimate is close to Winick's (1965) estimate based on when addicts dropped out of official notice. He estimated that the total years of addiction averaged 8.6, and found that only 7 percent of addicts had records covering a period of 15 years or more.

Despite this evidence for a natural decline and dropping out of addiction, elderly addicts do exist. Schuckit (1977) estimated that 5 percent of all Washington State addicts were older than 45. He identified 70 addicts who were older than 50. His figures, however, suggest that these older addicts are predominantly cases of late onset rather than long duration, since their average duration of drug use was only 9 years, the same duration as that of the younger addicts reported on by Winick and Brill.

THE AFTERMATH OF ADDICTION

Given the fact that addiction ends after approximately 9 years, it is important to know whether it leaves any permanent scars. These might be of three types. (1) The use of heroin might leave a permanent physical change, comparable to the damage done by alcohol, (2) Addiction might leave psychological marks, particularly in the form of craving for the drug, and (3) The lifestyle of the addict, developed to meet the needs of maintaining a supply of an illegal drug, might persist long after the addiction is over.

The first of these questions, that is, the physical effects of heroin on the body, seems to have been clearly answered in the negative. There appear to be no well substantiated studies showing that the addict has any physical disability as a result of having been addicted.

The phenomenon of craving in those no longer addicted has been remarkably little studied. However, the Vietnam addicts who had not used any heroin in the last 2 years were asked whether they had felt like taking narcotics at any time, and if so, whether it was a real craving or just a thought that crossed their minds (Robins et al. 1977). Only one-quarter reported that they had felt like taking narcotics, and only 4 percent identified this feeling as a craving rather than as a thought crossing their minds. Thus craving can occur and can be persistent, but it seems that it is a rare residual effect of heroin addiction, at least among men who had been addicted for only a relatively short period.

The question of whether there is a persistent effect on social adjustment as a result of the heroin experience is more difficult to answer. Many of those who become addicted while still in school drop out as a result of their addiction (Waldorf 1973). Since many never reenter the educational system, they clearly have an enduring handicap in terms of jobs requiring high levels of education. They also spend 8 or 9 years of what would have been part of their working lives in extremely erratic occupational efforts. As a result, addicts seldom develop the job skills and the seniority necessary to have a rewarding occupational life after recovery from addiction.

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[2] W. H. McGlothin 1978, personal communication.

To what extent addicts are able to become stable employees once their period of addiction is over is hard to assess, because so many of those investigated in followup studies of treatment programs are employed within those programs. Waldorf (1973) points out, for instance, that almost all of the Phoenix House graduates were still working there as drug counselors or in other roles. The fact that the treatment system absorbs its own graduates produces an illusion of occupational achievement that might not be substantiated in a less protected environment. Nurco and Lerner (1974) found that about one out of five ex-addicts is chronically unemployed. The question, of course, is whether that figure is any higher than one would expect of similar people if they had not become addicted. Robins et al. (1978) tried to decide whether there was any long-term effect of having been addicted to heroin in Vietnam on the later adjustment of Vietnam veterans who recovered. To do this, figures for the addicted veterans who had quit heroin on leaving Vietnam were statistically adjusted to make up for the fact that men who did not use heroin in Vietnam had been much more conforming individuals before entering service and therefore were less likely to have adjustment problems after return from service. A slight but significant increase in the number of adjustment problems was found among those veterans who had used heroin in Vietnam, even when they had not used any since. The only problem for which the difference was significant was difficulty with jobs. While there were slightly higher rates of crime, divorce, and the use of other drugs, these were not statistically significant. In contrast to findings of an association between withdrawal from heroin and increased alcoholism (Green and Jaffe 1977), veterans showed no increase in the rate of alcohol problems after addiction.

The most general conclusion one can draw is that there apparently are some handicaps in having been an addict, particularly in the area of job performance, but that differences are not very large. Certainly there is every reason to be optimistic about young addicts. They do recover, and they are likely to show few ill effects of their addiction once recovery takes place. This observation underscores the importance of trying to prevent the high death rate that characterizes the addictive period. Addicts' lives are well worth saving, because they are not "hopeless cases."

RECOMMENDATIONS FOR FUTURE RESEARCH

In reviewing what is now known about the addict career, a number of places in which we have inadequate information became obvious. We know almost nothing about which users of heroin will go on to become addicted and only a little about which addicts are likely to remit early. We know nothing at all about which of those who do remit are able to go back to heroin use without becoming readdicted.

Most of our results continue to be based on treated and imprisoned populations. This is not surprising because there are so few heroin addicts in the general population that it is very hard to locate them through any kind of sampling of general populations. For this reason, it would be very useful during general surveys of drug use in the population to ask those discovered to have been heroin addicts whether they would be willing to be followed at some later time. We might be able to develop a bank of randomly selected heroin addicts who could be studied intensively in a longitudinal fashion. Such a system has been used for identifying identical twins, for instance, similarly a rare group and of great interest for genetic studies.

One of the great gaps in our knowledge has to do with the amounts and pacing of heroin self-administration. Because there is no standard dosage for illegal drugs, the only possibility for studying this question would seem to be to identify and enlist the cooperation of a group of heroin users who would agree to be followed longitudinally. They would need to provide samples of the drugs they use or have urine samples taken within 24 hours of use to establish dosage levels. Such a study would probably be more useful than any further attempts at retrospective interviewing to establish the natural fluctuations in use. A similar closely monitored followup of men in remission from addiction could enlighten us about circumstances that provoke relapse. Without such a longitudinal study we will continue to know only that relapse occurs when the person feels like taking drugs!

Another area of great interest concerns the kinds of occupational roles in which ex-addicts can prosper. Their concentration in the field of drug therapists offers little scope. A study of the occupational adjustment of ex-addicts in terms of the kinds of jobs they hold and their success in them would improve the chances of making useful recommendations to those currently addicted about opportunities that are open to them.

Most of our treatment efforts are spent on actively addicted individuals, trying to get them off heroin. No services are offered to the many addicts who are in periods of spontaneous remission. So far there has not been a study comparing the relative chances that those who remit spontaneously will remain free of addiction compared to those who remit as a result of treatment. If spontaneous remitters have a better prognosis, it may be more reasonable to offer them extensive services in order to help them stay off heroin, rather than to spend our efforts exclusively on those who may not yet be ready to try to change their lifestyles. Evaluation of the effectiveness of such a program for spontaneously remitting addicts would be an important aspect of this suggested study.

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32. Marihuana: A Review of Recent Psychosocial Research

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INTRODUCTION

It was not much more than a decade or so ago that marihuana use in the United States was confined to the inner city ghetto, to blacks, or to jazz musicians. Within the span of a relatively few years, usage has become widespread and, perhaps more important for the future, public attitudes toward marihuana have become more accepting. Even the legal institutions have demonstrated an increasing tolerance through statutory accommodation in 10 States and a relaxation of the enforcement of existing statutes in other locales. As much as 5 years ago, some observers were already interpreting these trends as irreversible: ". . . one thing is unmistakably clear: marijuana use is now a fact of American life" (Brotman and Suffet 1973, p. 1106); ". . . marijuana use will probably become a cultural norm within a few years for persons under 30" (Hochman and Brill 1973, p. 609). How quickly such change may actually have occurred is indicated by Akers' (1977) recent description of the American scene, a description that would have elicited sharp disbelief even as recently as the late 1960s: "Marijuana is smoked in an offhand, casual way . . . Before, during, or after sports events, dates, public gatherings, parties, music festivals, class or work will do; there is no special place, time, or occasion for marijuana smoking. The acceptable places and occasions are as varied as those for drinking alcohol" (p. 112).

Such a description does not apply, of course, to all segments of the American population or to all parts of the country. But it suggests that what we have been witnessing with regard to marihuana use may well be a rather unusual instance of cultural change, noteworthy for its rapidity and for its parallel with other changes, for example in sexual attitudes and behavior, that have been underway simultaneously. Whether the change will be an enduring one and whether the use of marihuana will, as with alcohol, become fully institutionalized in American society is still a matter of considerable speculation and debate. But there is little in the research evidence currently available to suggest that it will not.

An unusual aspect of the recent American experience with marihuana is that, almost constantly from its inception, it has been under research scrutiny. While surveys have played perhaps the central role in monitoring the scope and contour of marihuana use, and in establishing the pattern of factors associated with that use, an enormous range of studies of all kinds has accumulated. Various aspects of the literature have already been appraised in the reports of the National Commission on Marihuana and Drug Abuse (1972a, b; 1973a, b) and in those of the Canadian Commission of Inquiry into the Non-Medical Use of Drugs (1972, 1973). Excellent reviews of the research on drug use and abuse, each devoting considerable attention to marihuana, have appeared in more recent years (Braucht et al. 1973; McGlothlin 1975; Sadava 1975; Gorsuch and Butler 1976; Petersen 1977; Kandel 1978a). Our aim in this review is to touch briefly on some of the main findings of the most recent research, that published within the preceding 5-year period. Our focus will be selective and illustrative rather than exhaustive, and it will be confined primarily to the psychosocial research domain.

The last 5 years have seen important indications of the coming of age of psychosocial research on marihuana. Despite problems that continue to plague the field, for example, the noncomparability of measures of use across different studies, an overview of the literature since the late 1960s reveals a number of salutary trends. There has been a shift from reliance on easily available, ready-to-hand, but largely adventitious samples to carefully drawn, national probability samples representative of important segments of the population; for example, Abelson et al. (1977) for youth and adults in households, Johnston et al. (1977a) for seniors in high school, and O'Donnell et al. (1976) for young men between 20 and 30. The first two of these surveys are in place as annual monitoring efforts that enable the estimation of population parameters and the tracking of change in the incidence and prevalence of marihuana use on a national level. There has also been a trend toward a more textured and differentiated assessment of marihuana use behavior; instead of the earlier focus on whether or not there has ever been any use at all of marihuana, more recent studies have shown concern for a variety of dimensions of use including frequency, recency, amount per occasion, and the simultaneous use of other drugs.

Increasingly, the research has tended to encompass measures of a larger network of psychosocial explanatory variables in contrast to the earlier preoccupation with demography and with epidemiological mapping. Along with this trend toward enlargement of the measurement framework, there has been more attention paid to distal variables—variables that are less obvious or that are linked to marihuana use by theory—and a less exclusive interest in proximal variables, those that are more obviously connected with marihuana use, such as positive attitudes toward drug use or the prevalence of drug use among one's friends. Another trend that has become apparent is the inclusion of measures of behavior other than marihuana use in studies of the latter. This trend goes beyond an interest in assessing other kinds of drug-using behavior, or investigating the possible effects that marihuana may have on other behaviors, such as academic performance, or crime and delinquency. Rather, it has been an attempt to understand marihuana use as part of a larger pattern of behavioral adaptation to life situations and to explore its commonalities with other forms of socially structured action.

Two other trends apparent in the marihuana research literature of recent years need mention. One of these has been the remarkable increase in studies that extend over time and that rely upon panel or longitudinal or developmental design (Johnston 1973; Kandel 1975; Sadava 1973a; Smith and Fogg 1978; Mellinger et al. 1976; Jessor and Jessor 1977; Johnston et al. 1978). An entire volume is devoted exclusively to longitudinal studies of drug use and includes contributions from a number of the major recent investigations (Kandel 1978b). The enlargement in explanatory capability that is achieved by longitudinal design, including the possibility of establishing temporal order and sequence, makes this trend one of exceptional significance.

The final direction that is obvious to even a casual observer of recent developments in psychosocial research on marihuana is the shift toward more complex and sophisticated research procedures. This trend includes more careful selection of research participants with appropriately matched control groups, such as was done in the elegant and already classic study of Vietnam veterans by Lee Robins (1974); the reliance on independent sources of information as in Kandel's (1974a) use of participant-parent-friend triads, and in Smith and Fogg's (1978) employment of peer ratings; the use of cohort-sequential design to permit the appearance of cohort effects in longitudinal studies (Jessor and Jessor 1977); and the employment of multivariate analytic procedures such as multiple regression and path analysis to deal with complex networks of variables. The empirical sophistication of the more recent studies is attested to by the fact that many of them report that very substantial portions of the variance in marihuana use—50 percent is not unusual—can be accounted for by multivariate analyses of their data.

These observations, while heartening, are not meant to convey an unrealistic sense of either knowledge or accomplishment in psychosocial research on marihuana. Refractory problems abound, and explaining 50 percent of the variance in marihuana behavior means, after all, that fully 50 percent remains unexplained. The point to be made is that these various trends, insofar as they come to characterize the ongoing research enterprise as a whole, hold promise for greater understanding in the future.

Commentary on the research of the past 5 years is organized under six different headings. The first section deals briefly with the current epidemiology of marihuana use, its extent and its distribution, and the direction of change in prevalence that has characterized the recent past. The second, third, and fourth sections focus respectively on social environmental, personality, and behavioral factors associated with marihuana use; these three areas constitute the main component systems in the psychosocial domain. The fifth section deals with developmental research on marihuana use. The final section considers some implications of the current findings for further research and for a possible initiative in the direction of the prevention of marihuana abuse.

EPIDEMIOLOGY OF MARIHUANA USE

Nationwide surveys of the general population, or of targeted subgroups within it, have yielded an unusual amount of information about the prevalence and distribution of marihuana use in this country. Josephson (1974) has summarized the findings from some of the earlier surveys, especially those bearing on the adolescent age group, and McGlothlin (1977) has recently reviewed the major epidemiological studies through 1976. From the perspective of early 1978, it is clear that marihuana is the most widely used of the illicit drugs, that a substantial proportion of the population—within certain age groups, it is a sizable majority—has had some experience with marihuana, and that marihuana use is continuing to increase in prevalence and in intensity, despite earlier forecasts that a leveling off was to be expected (see, for example, National Commission on Marihuana and Drug Abuse [1973a, p. 78]).

The most important sources of recent epidemiological information are the annual household surveys of the general population aged 12 and older sponsored by the National Institute on Drug Abuse and carried out by the Response Analysis Corporation of Princeton, New Jersey and the Social Research Group of George Washington University (see Abelson and Atkinson 1975, Abelson and Fishburne 1976; and Abelson et al. 1977 for the most recent in the series); the national surveys of high school seniors beginning with the class of 1975 and including the classes of 1976 and 1977 carried out by the Monitoring the Future project at the University of Michigan (Johnston et al. 1977a, b); and the nationwide survey of young men, aged 20 to 30 in 1974, drawn from the Selective Service registrations to be representative of young men in the continental United States (O'Donnell et al. 1976). Other studies of epidemiological interest are the longitudinal surveys of a national sample of high school males in the class of 1969—the Youth in Transition project—followed up most recently in 1974 (Johnston 1973, 1975), and the annual surveys of junior and senior high school students in San Mateo County, California, a local area of interest because of comparatively high rates of drug use and the availability of a decade of repeated surveys (Blackford 1977).

In the most recent national survey of the general population (Abelson et al. 1977), lifetime prevalence (whether marihuana has ever been used, even once) is substantial among older adolescents and young adults, and markedly patterned by age:

Age	Percent Ever Used
12-13	8
14-15	29
16-17	47
18-21	59
22-25	62
26-34	44
35+	7

Six out of 10 in the age range from 18 to 25 have had some experience with marihuana by 1977, and that figure holds fairly well for both males (66 percent) and females (55 percent). While the lifetime prevalence rate falls off on both sides of this time period, nearly half of those who are 16 to 17 years old and nearly half of those who are 26 to 34 years old have used marihuana at least once. Such data make clear the pervasiveness with which this illicit behavior has occurred, at some time, in a large segment of the American population. However, it should be emphasized that most of those who have had experience with marihuana have had only limited experience, and for many of them that experience is not current. For example, in contrast to the 60 percent of young adults aged 18 to 25 who have ever used marihuana, only about 28 percent of that age group used it in the month prior to the survey.

Beyond age, prevalence of marihuana use, both lifetime and current, shows variation in relation to sex (males higher than females), to census region (Northeast and West higher, South lower), to population density (large metropolitan areas higher), to education (college higher), and, in the younger age range, race (white higher). This variation does not hold across all age categories, and it is not comparable in salience to that associated with age per se.

Perhaps of most significance is the contribution of the 1977 survey to an understanding of whether prevalence has now stabilized or continues the increasing trend of the past decade. In comparison with the findings of the 1976 survey, the most recent one does reveal a significant increase for the 12- to 17-year age group in both lifetime prevalence and current use, and for the 18- to 25-year and the 26- to 34-year age groups in lifetime prevalence. Even where the changes over the year interval were not significant, the overall pattern for most breakdowns was one of increases and, when viewed against the results of the entire series of earlier surveys beginning in 1971, the trend toward increased prevalence of marihuana use is clearly continuing and is engaging broader segments of the population.

In the O'Donnell et al. (1976) nationwide survey of young men 20 to 30 interviewed in 1974-75, the age-relatedness of prevalence of marihuana use was also very apparent. While overall lifetime prevalence was 55 percent, the percentages for the younger age groups were in the 60s, whereas those for the older age groups were in the 40s; age 24 yielded the highest rate—66 percent with some experience with marihuana.

With respect to the sample of more than 17,000 high school seniors in the class of 1977, the findings of the latest survey from the Monitoring the Future project (Johnston et al. 1977a) are illuminating. Lifetime prevalence in the sample has reached 56 percent, a majority of this 18-year-old, in-school group having had at least one experience with marihuana by 1977. Current prevalence (use in the past month) has reached 35 percent in this sample, involving 1 of every 3 high school seniors. Of special interest in the findings is the fact that 9.1 percent of the survey sample, 1 out of 11, report daily or nearly daily use of marihuana, a rate that is now higher than that reported for the daily use of alcohol (the latter was 6.1 percent in the class of 1977). Lifetime prevalence of marihuana use is higher among males (62 percent) than females (51 percent), especially when higher frequency of use is considered, among the noncollege bound (60 percent) than the college bound (52 percent), highest in the Northeast (63 percent) and lowest in the South (51 percent), and highest in the very large cities (63 percent).

Buttressing the magnitude of these figures is the evidence that prevalence in the class of 1977, both lifetime and current, has significantly increased over that for the class of 1976 and, in turn, that of 1975, and the increases tend to characterize all of the subgroups previously listed. As in the 1977 national household survey discussed earlier, these data also indicate a continuation of the trend toward increasing prevalence of use for the specific age group represented by the high school senior sample.

Another indication of an increase in prevalence comes from the San Mateo survey (Blackford 1977). The 1977 data are reported for annual prevalence (use in the preceding year); that rate was 64.5 percent for 12th grade males (up from 61.1 percent in 1976) and 61.4 percent for 12th grade females (up from 56 percent in 1976). (For purposes of comparison, annual prevalence in the 1977 Monitoring the Future survey was 53 percent for the 12th grade males and 42 percent for 12th grade females.) The San Mateo increases over the past year are of particular significance since many expected that this high rate area had already reached saturation and was stabilizing at a level that might be a ceiling for marihuana prevalence.

Finally, the 1974 followup of the class of 1969 cohort in the Youth in Transition study shows quite clearly that the lifetime prevalence levels reached in high school do continue to increase with increasing age of the cohort after high school (Johnston 1975). Lifetime prevalence for the class of 1969 was 20 percent in their senior year, rose to 35 percent by a year later, and reached 62 percent by the 1974 followup when the cohort was 23 years old. Thus, there is no evidence for a prevalence plateau after graduation from high school.

The perspective that emerges from this series of nationwide surveys is that some experience with marihuana has, by 1977, become statistically normative among older adolescents and young adults, and that about a third of those in this age range have used marihuana in the past month. Lifetime prevalence is increasing in the next older age group as the younger cohorts age into it (the rate for those aged 26 to 34 more than doubled from 1972, when it was 20 percent, to 1977, when it was 44 percent; see Abelson et al. [1977]); the trend toward higher prevalence has continued to generate significant annual increases in all of the most recent surveys; initiation into marihuana use is taking place earlier (Johnston et al. 1977a); and daily use—a measure reflecting more than fortuitous involvement with marihuana—has increased in recent years. The continuing increase in marihuana use, incidentally, appears not to be specific to the United States; according to Smart (1977), its use is still increasing in Canada as well (see also Smart and Fejer 1975).

The implications of these epidemiological developments are significantly sharpened by two other considerations. First, important changes have simultaneously been occurring in many of the factors that are immediately relevant to the likelihood of marihuana use, factors such as knowing someone who has used marihuana, having the opportunity to use marihuana, beliefs about the harmfulness and risk associated with marihuana use, and attitudes about whether marihuana use should be legalized or decriminalized. According to the findings from both the 1977 national survey (reported in Miller et al. 1978) and the 1977 Monitoring the

Future survey (Johnston et al. 1977a), all of these factors have changed over recent years in the direction of greater exposure to and availability of marihuana, less perceived risk of use, less disapproval for use, and less support for legal prohibition of use. More recently, the annual American Council on Education survey of 300,000 entering freshmen to colleges and universities in the United States in the fall of 1977 found, for the first time, that a majority (53 percent) of freshmen supported legalization of marihuana (Astin et al. 1978). These convergent changes in what has been called "the social climate" of marihuana use (Miller et al. 1978) strongly suggest that involvement with marihuana is likely to continue to increase in the future.

The second consideration has to do with the recognition that national survey findings, despite the exceptional quality of those reviewed here, have certain limitations. Household surveys do not capture those not living in households, and school surveys do not capture dropouts; in both cases, the groups that are missed probably have higher rates of marihuana use than those who are included, and the survey findings are, to some degree, likely to be underestimates of population prevalence. Perhaps of more significance, nationwide surveys may not adequately reflect the fact that particular social or geographic locations may be of more than average influence on cultural change; thus, locations where marihuana use may be very high—for example, in a liberal arts college in a large metropolitan university—or where its use is an accepted part of "the scene"—for example, the Bay Area—may have more impact on future trends in the acculturation of our society to marihuana than is apparent when those locations are averaged in with other sampling units.

The data that have emerged from the latest epidemiological surveys, taken together with the trends that are evident across the recent series of such surveys, suggest that marihuana has to some extent become embedded in American culture (see also Ray 1978). Its institutionalization appears to be reflected not only in the broad pattern of its availability and use, but also in the supportive social definitions that are increasingly shared about its nature and its function. If, indeed, this has become the case, then it would seem apposite for national concern about marihuana to shift from the question of its use to the problem of its abuse.

MARIHUANA USE AND THE SOCIAL ENVIRONMENT

As we have already noted in the preceding section, variation in marihuana use is less sharply patterned than it was in the past by attributes of the sociodemographic environment; where such attributes still emerge as significantly related, the trends over time suggest that their role is a diminishing one. This is true for urbanicity or population density (Johnston et al. 1977a) and for race and socioeconomic status (Miller et al. 1978). It is also true for sex; although national rates remain higher for males than females, the difference is not of the magnitude that might have been expected for such an illicit behavior, and, in several recent studies, the sex difference in lifetime prevalence has all but disappeared (Wechsler and McFadden 1976; Akers et al. 1977; Jessor and Jessor 1977). The decline in distinctiveness of population density or urban residence as relevant environmental attributes is paralleled by a declining distinctiveness of other characteristically use-prone settings such as college campuses or military life. O'Donnell et al. (1976), for example, describe the effects of military service on drug use as "invisible" in their cohorts of men between 20 and 30, and this applies to effects on marihuana use as well. At the level of the demographic environment, then, there has been a trend toward homogenization as far as variation in marihuana use is concerned. Put in other terms, demographic environmental attributes account for only a small, and increasingly a smaller, portion of the variance in marihuana use.

By contrast, the environmental factors that have emerged repeatedly as salient in relation to the prevalence and intensity of marihuana use are those that refer to the environment of social interaction. The key role played by friendship patterns and interpersonal relations in providing access to and availability of marihuana, models for using it, and social support for such use have been affirmed in a host of studies. One investigator has concluded that, in explaining adolescent marihuana use, "marijuana use by one's friend . . . may be the critical variable" (Kandel 1974b, p. 208). This emphasis on friends or peers as the most important social agent, and on their actual use of marihuana as the most important contextual variable, while supported by the research, ought not to result in ignoring other agents or other aspects of the social interaction situation. The most general point to be made from the research is that marihuana use varies directly with attributes of the context of social interaction—with social models, with social reinforcements, and with social controls, both general and marihuana-specific.

The importance of the use of marihuana by one's friends is readily seen in the data from the national survey of young men 20-30 (O'Donnell et al. 1976). Among users of marihuana in the survey year (1974-75), fully 98 percent report that at least "a few" of their friends are current users; among never users of marihuana, the comparable figure is only 56 percent. Not only is own use versus nonuse related to use by friends, but intensity of own use varies directly with prevalence of use among one's friends. Again referring to the O'Donnell et al. (1976) data, the percent who report "more than a few friends now using marihuana" are nonusers (18); experimental users (41); light users (69); moderate users (76); and heavy users (94). The heavier the involvement with marihuana, the more likely that one is embedded in a friendship network in which marihuana use is a characteristic pattern of behavior (see also Johnson [1973]).

Although the earlier interpretations of the importance of friends or peers used the evidence to sustain the notion of a drug subculture with its own values and norms (Suchman 1968), or of a student subculture (Thomas et al. 1975), the tenability of such a perspective is increasingly eroded by the spread of marihuana use to broader and broader segments of the population. Under such circumstances, there seems little need for recourse to a subculture concept; indeed, the role that peers play in relation to marihuana use appears to be no different than the role they play in relation to various other domains—values, sexual behavior, styles of dress—in which their socialization impact is considerable. Dispensing with the subculture notion enables the assimilation of peer influence on marihuana use into the larger function of peer socialization as a whole (for an empirical questioning of the notion of a drug subculture among adolescents, see Huba et al. [1978]).

In an interesting study of peer influence on marihuana use among a representative sample of public secondary students in New York State, Kandel (1973, 1974a, b) collected independent data from the best school friend and from the parents of a subsample of her respondents. Peer drug use emerged as a far more important influence on the respondent's use of marihuana than parental use of drugs. With the availability of independent data from parents and friends, Kandel was able to compare the relation of *perceived* parental drug use with *parent-reported* drug use, and the relation of *perceived* peer drug use with *peer-reported* drug use. In both cases, the relation to the respondent's own use was attenuated when independent data rather than perceived data were used. This is an important finding since most studies rely upon perceived data. Nevertheless, it should be emphasized that the nature of the relationships is maintained even though attenuated, and it should also be noted that the question of the differential *validity* of the two kinds of data is not resolved in the study.

More recently, the Jessors have explored the influence of environmental factors on variation in marihuana use in their longitudinal study of high school and college youth (Jessor and Jessor 1973, 1977, 1978). Consonant with the earlier discussion, they found almost no relation between attributes of the sociodemographic environment, including the Hollingshead index of socioeconomic status, and marihuana use. Employing, instead, the concept of the "perceived environment" (Jessor and Jessor 1973), they distinguish variables that are conceptually *proximal* to marihuana use (such as models and approval for its use which directly implicate its occurrence), and variables that are conceptually *distal* to marihuana use (such as general peer support, or parental controls, or relative parent-versus-peer influence which can have only indirect implications for marihuana use). The usefulness of the proximal-distal distinction is that it calls attention to less immediately obvious aspects of the social environment than whether or not one's friends use marihuana, and it yields, thereby, a more textured analysis of environmental influence. As expected, proximal variables such as friends' models for marihuana use were consistently the most powerful, yielding correlations in the .60s with marihuana involvement; distal variables such as the exercise of interpersonal controls by friends were considerably less powerful, yielding correlations in the .30s, but still highly significant. Taken together as a system, the perceived environmental variables accounted for about 40 percent of the variance in involvement with marihuana in both the high school and college studies (Jessor and Jessor 1977). These findings about the salient role of the environment are fully replicated in a nationwide survey of 13,000 secondary school youth (Chase and Jessor 1977).

The role of friends in providing direct social reinforcement or punishment for marihuana use, knowledge about and normative definitions of use, as well as models for use, was investigated in a recent effort to test another version of social learning theory (Akers et al. 1977). Carried out under the aegis of the Boys Town Center in Nebraska, it involved about 3,000 secondary students in 8 Midwestern communities. Again, differential association with using or nonusing friends was found to be the most powerful variable, but the study offers a more differentiated analysis of the variables through which the influence of friends is exerted.

Despite its demonstrably lesser influence, the role of parents may not be entirely dismissed when marihuana use among adolescents and youth is considered. Already noted has been Kandel's (1974b) finding about the influence of parental use of psychoactive drugs on the adolescent's use of marihuana. Other aspects of parental influence, beyond whether they themselves use drugs, have also been investigated. Variation in marihuana use has been linked to the degree of parental strictness and controls, to parental affection and support, and to parental conventionality or traditionality in ideological outlook—the greater each of these parental attributes, the less the marihuana involvement by the adolescent (Jessor and Jessor 1974; Brook et al., in press; Prendergast 1974). Of interest is the evidence that the role of parental support and controls—at least as perceived—diminishes in its importance for marihuana use from the younger aged, high school period to the older aged period when youth are in college (Jessor and Jessor 1977).

The restriction of this section to peer and parent influence in the environment of social interaction reflects the almost exclusive concern of researchers with just these two agents of socialization, support, and control. Almost no attention has been paid to the church or school as institutions of socialization, or to symbolic agents such as the television media. What little research there is, however, suggests that involvement with all three of these latter sources of influence may serve to control against involvement with marihuana use (see Jessor and Jessor [1977, chapter 11].)

The prepotent role of the social interaction context—the prevalence of models among one's friends, of attitudes of approval or at least lack of disapproval, and of access to the drug and to the opportunity to use it—is empirically well established by the research of recent years. But the significance of this generalization should be tempered on at least two grounds. First, every study showing the importance of friends' usage of marihuana showed, nevertheless, that some proportion of those with friends or acquaintances who are users themselves do not use. How does one account for this? The fact that not everyone behaves the same way in the same context of interaction raises the need for other kinds of explanatory factors, factors that refer to individual differences, differences not in social context variables but in personality. Second, all of the trend data suggest that the future will bring higher base rates of use and of knowledge of users. At some point soon, there is likely to be a homogenization of the social interaction environment as far as marihuana use is concerned, that is, most people will have at least some friends who use, will know other people who use, and will perceive little social disapproval for use. Yet it is quite predictable that even in such a homogeneously use-prone environment, some proportion of people will nevertheless refrain from use (at least that is the lesson from alcohol). To account for those who refrain will require, again, recourse to factors that are not those of the shared social environment but those that reflect individual differences in personality. Research on the latter is the concern of the following section.

MARIHUANA USE AND PERSONALITY

Recent research has established coherent and systematic linkages between aspects of personality and variation in marihuana use. Despite quite different levels of analysis, theoretical orientations, populations, and measuring instruments, there is a notable degree of consistency in what has been found about the personality correlates of use versus nonuse or of degree of involvement with marihuana. And the pattern of findings tends to be relatively invariant over sex, ethnic status, and other demographic attributes. In the studies that have been reviewed, personality refers to that set of relatively enduring psychological attributes that characterize a person and constitute the dimensions of individual differences, including values, attitudes, needs, beliefs, expectations, moral orientations, and other such essentially sociocognitive variables. Personality in this body of research reflects more the sociocognitive level of analysis than it does the underlying dynamics of the traditional psychoanalytic perspective. Important to emphasize, also, is that these attributes of personality are neutral with respect to the issue of adjustment-maladjustment or the question of psychopathology; the relevance of the latter will be addressed subsequently as an empirical issue rather than as one that is necessarily inherent in any general concern with personality. Finally, many of the personality attributes that have been established as correlates of involvement with marihuana have also been shown to be antecedents or precursors of such involvement. This is a finding of central significance in strengthening conviction about the systematic tie between personality and marihuana use behavior.

Perhaps the largest generalization that is warranted by the research on personality is that users of marihuana differ from nonusers on a cluster of attributes reflecting nonconventionality, nontraditionality, or nonconformity. This emphasis was, of course, fore-

31

shadowed in the early paper on the "hang-loose ethic" by Suchman (1968). Involvement with marihuana has been associated with a variety of components of such a cluster: with more critical beliefs about the norms and values of the large society and with a sense of disaffection with or alienation from it (Knight et al. 1974; Groves 1974; Hochman and Brill 1973; Weckowicz and Janssen 1973; Jessor et al. 1973); with less religiosity (Rohrbaugh and Jessor 1975); and with a more tolerant attitude toward deviance, morality, and transgression (O'Donnell et al. 1976; Brook et al. 1977a, b; Jessor and Jessor 1978). Related to the same cluster are the findings about the greater rebelliousness (Smith and Fogg 1978), ascendency (Gulas and King 1976), and value on and expectation for independence or autonomy (Sadava 1973b; O'Malley 1975; Jessor et al. 1973) of users or future users in contrast to nonusers. Conventionality-unconventionality is reflected further in the greater emphasis by nonusers on achievement and achievement striving—conventional goals of our society (Holroyd and Kahn 1974; Sadava 1973b; Mellinger et al. 1975; Chase and Jessor 1977; Jessor et al. 1973) and on responsibility (Gulas and King 1976). Nonusers also score higher on the Marlowe-Crowne Social Desirability Scale, an index of social conformity (Brook et al. 1977a, b). These findings are consonant across early reports (Hogan et al. 1970) and also more recent studies (Johnston 1974; Kandel et al. 1978) which emphasize the notions of conformity to adult or societal expectations and conventionality as distinguishing nonusers from users or heavier users.

A second generalization about personality differences associated with variation in marihuana use is that users tend to be more open to experience, more aesthetically oriented, more interested in creativity, play, novelty, or spontaneity (Groves 1974; Stokes 1974; Segal 1975; Naditch 1975; Weckowicz and Janssen 1973; Shibuya 1974; Mellinger et al. 1975; Holroyd and Kahn 1974). These attributes are not unrelated to the preceding cluster of conventionality, but what is emphasized more is a cognitive style of receptivity to uncertainty and change as against an emphasis on familiarity and inflexibility. Since marihuana is often sought specifically to initiate change in mood or outlook, this linkage with a general interest in sensation- or experience-seeking (Segal 1975; Kohn and Annis 1978) is a logical one.

A third generalization, perhaps, is that marihuana use was associated not only with lower value on achievement but with lower expectations of being able to gain achievement satisfaction. These findings make relevant the possibility that marihuana use can be a response to frustration, to the perception of blocked access to valued goals, and to the anticipation of failure; it may be implicated as a way of coping with such feelings or as representing a choice to pursue alternative goals than those for which little success is anticipated (Carman 1974; Braucht 1974; Jessor et al. 1973).

Other attributes of personality have also received considerable attention, but the empirical consensus on these remains equivocal (see the excellent compendium edited by Lettieri [1975] for a number of articles dealing with various personality measures). One of these is the internal-external control (I-E) or locus of control variable. Plumb et al. (1975) have published an extensive review of the mixed outcomes of the relevant I-E studies. Some investigators report that marihuana use is associated with higher internal control (Brook et al. 1977a, b; Sadava 1973b). Other investigators (Jessor and Jessor 1977) find the I-E variable yields little distinction between high school and college users and nonusers, but where there is a significant relationship—for high school males only—it is in the opposite direction, marihuana involvement being associated with higher externality (for similar results, see also Naditch [1975]). Another attribute that has been studied intensively but also with inconsistent results is self-esteem. Kaplan (1975) has related a lowering of self-esteem to subsequent involvement with marihuana use, and Norem-Hebeisen (1975) reports some cross-sectional discriminability of her self-esteem measures, but others have been unable to link variation in self-esteem to marihuana use or subsequent onset of use (O'Malley 1975; Kandel et al. 1978; Jessor and Jessor 1977).

Kandel (1978a) has correctly called attention to the fact that affective and mood states as personality attributes have been given scant attention in approaches focused on the sociocognitive level of analysis of personality. Her own work has suggested depressive mood as a modest predictor of subsequent marihuana use (Paton et al. 1977). With regard to another affect-related attribute—extroversion as measured by the Eysenck Personality Inventory—Wells and Stacey (1976) found it unrelated to drug use among young people in Scotland, and Smart and Fejer (1973) found adult marihuana users scoring in the normal range on extroversion, though higher than nonusers. Another possibly relevant attribute in this domain is field dependence-independence, but it also fails to distinguish in relation to marihuana (Weckowicz and Janssen 1973).

Although the foregoing summary has sought to integrate the various findings, all of them have emerged from studies that have emphasized differences between users and nonusers in magnitude of an attribute or a set of attributes. An unusually interesting study has asked a different kind of question. Is the organization of personality attributes different between user and nonuser groups? Huba et al. (1977) studied the organization of 15 needs, drawn from Henry Murray's personality theory, in over 1,000 college students at two universities. They found good factorial stability for the needs, for both sexes, in both drug and nondrug groups, and were able to establish that personality organization is qualitatively the same in users of marihuana or other drugs as in nonusers of these substances. This attention to the organizational structure of personality motivation is especially salutary because it suggests that while users differ quantitatively from nonusers (as they do in this study, also), they are qualitatively similar to nonusers in organization and functioning.

A concern with personality has been central to the work of the Jessors in their longitudinal study of high school and college cohorts. Their personality and marihuana findings have been presented in a recent book (Jessor and Jessor 1977), and represent an effort to deal with personality as a system of motivations, instigations, beliefs, and personal controls. In relation to a criterion of degree of involvement with marihuana, the personal control variables are shown to be most strongly related; higher involvement is associated with lower religiosity and greater tolerance of deviant behavior among both high school and college males and females. At the high school level, higher involvement with marihuana is also associated with lower value on academic achievement, lower expectations of attaining that goal, and with higher value on independence and on independence relative to achievement. It is significant that none of these latter associations holds at the college level. Finally, the higher the involvement with marihuana, the greater the critical attitude toward the society and its institutions for both sexes in both high school and college. To assess the role of personality as a system, multiple correlations were run against the marihuana use criterion; they show that between 20 and 25 percent of the variance in marihuana involvement can be accounted for by the joint role of the set of personality measures—a substantial and significant amount (although less than that accounted for by the perceived environment system). In an application of the same framework to a national sample of 13,000 high school youth, personality system variables again accounted for about 20 percent of the variance in marihuana involvement for both sexes (Chase and Jessor 1977).

A recurrent issue when personality is dealt with is whether or not maladjustment or psychopathology is implicated in the use of marihuana. The findings in the foregoing studies are generally neutral with regard to psychopathology, stressing, instead, variation in attitudes, values, beliefs, and other such sociocognitive aspects of personality. But a large number of studies have been specifically concerned with answering the maladjustment-psychopathology question, and the empirical outcome seems quite clear. With only a few exceptions (Wells and Stacey 1976; Smart and Fejer 1973), the preponderant conclusion is that there is no association between marihuana use and maladjustment or psychopathology (Naditch 1975; Mellinger et al. 1975; O'Malley 1975; Stokes 1974; Goldstein and Sappington 1977; Costa 1977; Hochman and Brill 1973; Cross and Davis 1972; Weckowicz and Janssen 1973; McAree et al. 1972; Richek et al. 1975). In some instances, a very heavy marihuana user group will appear to have more extreme indication of psychopathology (e.g., Cross and Davis 1972), but such a group is inevitably involved with multiple drug use or with the use of harder drugs in addition to marihuana, and this state of affairs confounds the inference about marihuana use alone. Where only marihuana is involved (but including alcohol and tobacco, of course), the explanation of variation in marihuana use gains nothing from recourse to psychiatric or psychopathological explanatory concepts according to the preponderance of the recent research literature.

The empirical relationships between personality and marihuana use have contributed to understanding of several critical questions: why certain persons in a particular social context, say students at a given college, have had experience with marihuana while others in the very same setting have not; why certain persons in a particular setting may use marihuana in an experimental or occasional way while others may become more heavily involved with it; and, as we will see more directly in the later section on psychosocial development, why some persons, say in the very same high school class, begin use of marihuana early while others begin later. Questions about variation in marihuana use where the social environment is constant or controlled find logical answers in the kinds of personality or individual difference variation represented in the research just described.

Although this position about the role of personality variation is a general and even logical one, it is of interest to consider whether the specific attributes that have been linked with marihuana use are, in some sense, time-bound or historically parochial. For example, as marihuana use becomes increasingly pervasive and normative, is its use likely any longer to be linked with unconventionality? As it becomes decriminalized, is its use likely any longer to serve as an expression of sociopolitical criticism and repudiation of the established society? It should be obvious that the particular personality factors likely to be associated with any pattern of behavior depend upon the social meanings and definitions of that behavior; as the social definitions change—for example, as marihuana shifts to a normatively employed recreational drug—the personality factors should also be expected to change. Three likely exceptions to this kind of anticipation about the future are worth noting, however. First, marihuana use, like other problem behaviors, is age-graded; that is, it is seen as less acceptable for younger than for older youth. Thus, it is likely that early onset of use will continue to be associated with a general pattern of personality nonconventionality. Second, no matter how normative marihuana use becomes, some segment of the population will refrain from experience with it and, for this segment, strong personal controls having to do with religiosity or intolerant attitudes toward transgression will likely continue to be characteristic. And finally, while this cluster of personal controls may no longer be relevant to whether most people use marihuana or not, it may continue to be relevant in regard to the intensity of its use. The possibility that personal controls may have a key role in preventing marihuana abuse makes the relevance of personality a lively and continuing concern in future social policy about marihuana.

MARIHUANA USE AND BEHAVIOR

A third major psychosocial domain with which marihuana use has been linked is the domain of social behavior. The most ubiquitous generalization that can be made is that marihuana use, far from being an isolated behavior, is generally part of a larger behavioral pattern involving the use of other drugs and engaging in a variety of other unconventional or nonconforming actions such as delinquency, sexual experience, political activism, and attenuated academic performance. An understanding of marihuana use as an integral element in a network of social behavior has large implications for social policy, both at the level of control and at the level of prevention or health promotion.

The linkage of marihuana use to the use of other drugs, both licit and illicit, is well established in nearly all studies that assess a variety of drugs. Further, the greater the involvement with marihuana or the frequency of its use, the greater the experience with other drugs (Goode 1974a, b; Johnson 1973; Johnston 1975; Kandel 1978a; O'Donnell et al. 1976; Rouse and Ewing 1973). The positive correlations obtained among the various drugs is quite compelling evidence against the notion of drug substitution—that use of a given drug, say marihuana, would imply less use of another drug, say alcohol. Johnston (1975), for example, reports that the proportion of regular marihuana users in the Youth in Transition cohort who used alcohol on at least a weekly basis rose from 56 percent to 81 percent between 1970 and 1974, reflecting an increasing association in use of these drugs.

Recognition of the association between marihuana and other drug use has led to considerable interest in the order with which experience with different drugs takes place and to a concern with sequential developmental stages of initiation into the use of different drugs. O'Donnell et al. (1976) report that among their male cohorts between ages 20 and 30, alcohol was antecedent to the use of all the other drugs including marihuana. But for men who used marihuana and any of the other drugs (cocaine, opiates, heroin, sedatives, stimulants, or psychedelics), use of marihuana usually occurred first; use of beer and/or wine; cigarettes or hard liquor; marihuana had not been used. Kandel's research has also focused on this question (1975, 1978a; Kandel et al. 1978); her longitudinal surveys of New York State high school students suggest four "stages" in the progression from no drug use to the use of illicit drugs "harder" than marihuana: use of beer and/or wine; cigarettes or hard liquor; marihuana, and other illicit drugs. Of interest is her emphasis on the role of experience with the licit drugs as a necessary intermediate between the stage of no experience with drugs and the use of marihuana; whereas 27 percent of students who used tobacco and alcohol began initial use of marihuana by the followup period 6 months later, of those who had not used any licit drug, only 2 percent began (Kandel 1975).

Both in terms of order of onset and of prevalence of use, marihuana emerges as a "boundary" drug between the licit drugs, like tobacco and alcohol, and the other illicit drugs. This key position of marihuana in a developmental sequence has raised the question of whether it serves as a "steppingstone" to the use of other illicit drugs. That use of marihuana is associated with a higher rate of experience with other illicit drugs has already been noted, what the steppingstone notion implies is that experience with marihuana has inexorable implications for progressing to other illicit drugs. Although this issue cannot be simply dismissed (see O'Donnell et al. 1976; Whitehead and Cabral 1976), and although it is likely that engaging in the use of an illicit drug such as marihuana can stimulate the exploration of other illicit drugs, several considerations militate against assigning a "causal" role to marihuana use. First, the proportion of the population that has ever used marihuana is far greater than the proportion with experience with any of the other illicit drugs; thus, there is no inexorable progression. Second, as the data from the Monitoring the Future surveys show (Johnston, Bachman, and O'Malley 1978), there has been an appreciable rise in marihuana use among youth in recent years without any concomitant increase in the proportion using other illicit substances. Third, it is logical to consider that the same factors that determined the use of marihuana may also influence the use of other illicit drugs, rather than the influence on those other drugs necessarily stemming from marihuana use itself. And finally, assigning cause to an antecedent permits an infinite regress in which it could be argued, for example, that since alcohol preceded marihuana, it is the more fundamental cause of other illicit drug use (see also Goldstein et al. [1975]).

The linkage of marihuana use to other drug use behavior is probably best seen as one aspect of a larger set of linkages between marihuana use and other kinds of behavior reflecting nonconventionality or deviance or what has been called "problem behavior" (Jessor and Jessor 1977). Marihuana use in teenagers has been shown to be strongly associated with frequency of drunkenness (Wechsler and Thum 1973; Wechsler 1976; Jessor et al. 1973; Chase and Jessor 1977), with sexual intercourse experience (Goode 1972a; Jessor and Jessor 1975); with delinquent or general deviant behavior (Johnston, O'Malley, and Eveland, 1978; Carpenter et al. 1976; Elliott and Ageton 1976a; Gold and Reimer 1975; Jessor et al. 1973; Chase and Jessor 1977), with activist protest (Jessor et al. 1973), and negatively associated with conventional behavior such as church attendance (Jessor et al. 1973; Chase and Jessor 1977). For example, in the 1972 year of the Jessors' study of high school youth, 44 percent of the males who had used marihuana were nonvirgins while only 17 percent of the males who had not used marihuana were nonvirgins; the corresponding figures for the females were 67 percent and 20 percent, respectively (Jessor and Jessor 1977). Among the young adults in the O'Donnell et al. (1976) study, users of marihuana were considerably more likely to report having committed criminal acts than nonusers, a finding similar to that for teenagers.

What these studies all sustain, without exception, is the covariation between marihuana use and other behaviors reflecting unconventionality. There appears to be a syndrome of unconventional or nonconforming behaviors in which marihuana use is a component part. These associations with other behaviors provide part of the social meaning of marihuana use; at the same time, they help reduce the possibility of arbitrariness in any decision to engage in the use of marihuana.

The emphasis in the preceding paragraph has been upon association, and no inferences have been drawn about the causal influence of marihuana on the set of related behaviors. The possibility that marihuana does play a causal role in relation to other behavior has been raised frequently in at least two areas—the area of crime and delinquency, and the area that has come to be called "the amotivational syndrome." Both of these deserve comment. The literature on the question of whether marihuana use leads to crime or delinquency has been reviewed repeatedly (Goode 1972b, 1974a, b, 1975; Elliott and Ageton 1976b). Abel's review (1977) found no evidence for a causal relation between marihuana and aggression or violence. The National Commission on Marihuana and Drug Use (1973a) concluded that marihuana neither instigated nor increased the level of crime and that the relation between marihuana use and crime or delinquency depended upon social, cultural, and psychological variables. Several studies involving youth find evidence that delinquency precedes involvement in drugs (Jacoby et al. 1973; Friedman and Friedman 1973; Jessor 1976; Johnston, O'Malley, and Eveland 1978). The longitudinal study of the Youth in Transition cohort provides an unusually compelling analysis of the relation of illicit drug use to delinquency in a nationwide sample of young men in high school. A five-category index of illicit drug use was related to measures of delinquency at each of five points in time. The longitudinal data enable the authors to show that the differences in delinquency among the nonusers and the various drug-user groups existed before drug usage; thus, they cannot be attributed to drug use. Their conclusion about the association between drug use and delinquency is that since both are deviant behaviors they are both likely to be adopted by individuals who are deviance prone, and deviance proneness is expressed through different behaviors at different ages—delinquency earlier, drug use later (Johnston, O'Malley, and Eveland 1978).

This conclusion is consonant with the conclusions of Elliott and Ageton (1976b) who present a very perceptive analysis of the recent studies on the relationship of drug use and crime among adolescents. In rejecting the notion that marihuana use has a causal influence on delinquency, they argue that both delinquency and marihuana use are manifestations of the same phenomenon—involvement in deviance or problem behavior—and are associated with each other by virtue of a common relationship to social, psychological, and economic etiological variables. This seems a reasonable summary of the state of current research knowledge in this area.

The relationship of marihuana use to the so-called amotivational syndrome—apathy, poor school performance, career indecision—entails the same logical issues as the marihuana-crime relationship. Empirically, some cross-sectional relationship has been found between marihuana use and various indicators of the amotivational syndrome (Brill and Christie 1974; Annis and Watson 1975; Smith and Fogg 1978; Mellinger et al. 1976, 1978; Jessor et al. 1973), although other studies have not (Marin et al. 1974; Johnston 1973). Once again, longitudinal studies indicate that lowered academic performance, school dropout, and career indecision may antedate drug use. In a series of very interesting papers, Mellinger and his collaborators have explored the relation of marihuana use to grades, career indecision, and dropping out among a cohort of male freshmen followed over time at the University of California, Berkeley (Mellinger et al. 1976, 1978). They found no convincing evidence that use of marihuana had adverse consequences in these areas. Instead, as in the case of the marihuana-crime relationship, dropping out of school, career indecision, and grades, as well as the use of marihuana, appear to reflect common background factors and social values.

In relation, then, either to crime or the amotivational syndrome, no causal role has been established for the use of marihuana. The linkage of marihuana to these areas of behavior, as to other areas such as sexual experience, alcohol use, or activist protest, seems best explained as part of a behavioral syndrome of nonconformity related to a common set of social and psychological factors that represent proneness to deviance or problem behavior.

MARIHUANA USE AND PSYCHOSOCIAL DEVELOPMENT

Research on marihuana and psychosocial development has been especially illuminating because of its reliance on longitudinal design. Not only has longitudinal design enabled the disentangling of temporal order in issues such as those addressed in the preceding section, but it has also revealed that marihuana use—just as alcohol use or sexual experience—is an integral aspect of youthful development in contemporary American society. A comprehensive review of convergences in recent longitudinal studies of marihuana use and other illicit drugs has been prepared by Kandel (1978a); she has also edited a volume in which several of the studies are described by the investigators responsible for them (Kandel 1978b).

A number of investigators have documented through time-extended studies that initiation or onset of marihuana use in samples of youthful nonusers is a predictable phenomenon based on social, psychological, and behavioral characteristics that are antecedent in time to its occurrence. The 5-year longitudinal study of elementary and secondary school students by Smith is a good illustration of this kind of research (Smith and Fogg 1974, 1977, 1978). Relying on both self-report and peer rating measures focused largely in the areas of personal competence and social responsibility, these investigators were able to demonstrate, over a 4-year interval, significant prediction of onset versus no onset of marihuana use (Smith and Fogg 1974), of variation in time of onset (early versus late) of marihuana use (Smith and Fogg 1978), and of variation in extent of later use of marihuana (Smith and Fogg 1977). A key predictor in their analyses has been a factor analytically derived rebelliousness scale, a measure that refers to the nonconventionality of personality discussed earlier in this paper. An interesting series of papers has also emerged from Sadava's 1-year longitudinal study of nearly 400 Canadian college students (Sadava, 1973a, Sadava and Forsyth 1976, 1977). Again, significant multivariate prediction of onset of use (and of other status changes such as discontinuation of use) has been demonstrated; these investigators rely on a field-theoretical approach that combines antecedent personality and environmental measures, as well as change scores on those measures over the time interval, as their predictors.

In terms of the content of the antecedent measures, there is strong convergence across these studies and others (Johnston 1975; Kandel et al. 1978; Jessor and Jessor 1978). The antecedent factors that are predictive of onset, time of onset, and extent of use are essentially the same ones that were reviewed in the earlier sections of this chapter as social environmental, personality, and behavioral correlates of marihuana use. Those nonusers who are more likely to initiate marihuana use, to initiate it earlier, and to become more heavily involved are already less conventional in personality attributes such as religiosity or tolerance of deviance, are more critical of adult society, have more friends who use marihuana and approve its use, and are more involved in other problem behaviors such as delinquency or excessive alcohol use.

This general pattern has been termed "transition proneness" by the Jessors (Jessor and Jessor 1977), a proneness toward developmental change that involves engaging in those age-graded behaviors that mark transitions in status from child to adolescent or from teenager to adult. Marihuana use is considered such an age-graded, transition-marking behavior, just as is the case for initiating alcohol use or becoming a nonvirgin, and this pattern of transition-prone attributes has been shown to predict onset of these other behaviors as well as the initiation of marihuana use. In this respect, the Jessors have sought to emphasize the developmental role that marihuana use plays and its commonality with other developmentally significant behaviors.

Two other aspects of the relationship of marihuana use to psychosocial development should be mentioned. First, the onset of marihuana use has been shown to be associated with systematic changes on the psychosocial variables that were predictive of that onset. Jessor et al. (1973) reported that residual gain scores over a year's interval showed greater change on the predictor variables when marihuana onset occurred than when it did not (see also Sadava and Forsyth 1976, 1977). Thus, change in marihuana behavior may be seen as part of a larger pattern of simultaneous developmental change. Second, it has also been shown, for high school youth at least, that time of onset of marihuana use over a 3-year interval is systematically related to the shape of the longitudinal trajectories or growth curves of a variety of the psychosocial predictor variables (Jessor 1976; Jessor and Jessor 1977, 1978).

Taken together, all of these longitudinal studies make clear that initiation into the use of marihuana, far from being an arbitrary event, is an integral part of psychosocial development among youth. Its onset can be forecast, and it can be shown that when onset does occur, its implications reverberate through the larger network of changes in personality and social interaction that are characteristic of growing up in contemporary American society.

SOME CONCLUDING REMARKS

It seems safe to predict that marihuana use will continue to increase in prevalence in American society, not only among youth but in other age groups in the population as well. Its increasingly shared definition as a recreational drug, and the decreasing proportion of the population that disapproves of its use and that perceives any risk associated with its use, signal its likely institutionalization as part of ordinary social life. It is this anticipation that makes it even more important that research on marihuana be expanded; maximum knowledge about marihuana should be the context in which individual choice is exercised and personal decisions are reached about using it and about how to use it.

That use of marihuana is not without negative effects, for example, the impairment of driving skills, is already clear (Jones 1977), and further research on both acute and chronic effects, especially of heavy use and of use in relation to other drugs, is important. The possibilities for studies of the effects of long-term use of marihuana in this country are increasing as cohorts that began use in the 1960s now have members with more than a decade of continuous experience with the drug.

Greater understanding would come also from research on the positive or beneficial outcomes of using marihuana. Although significant portions of the frequent marihuana users in a national sample of high school seniors acknowledged problems associated with its use—interfering with the ability to think clearly, causing one to have less energy, hurting performance in school or on the job (Johnston 1977)—the general finding is that users tend to evaluate their experience as positive, pleasant, and beneficial (Goldstein 1975; Weinstein 1976; Orcutt and Biggs 1975; Fisher and Steckler 1974). Among the cohorts of men between 20 and 30, marihuana was the only drug for which more users reported the effect on their lives as good or very good than reported it as bad or very bad (O'Donnell et al. 1976). Since positive functions of use or reasons for use constitute a powerful proximal influence on actual use, further knowledge about the perceived benefits of using marihuana would seem important in understanding how continued use is sustained and how experimental use is initiated.

More research on the ethnography of marihuana use would also be useful. For example, Zimmerman and Wieder (1977) describe a particularly high-use context and point out that, in contrast to most occasions of alcohol use, a smoking occasion has no definite boundaries in time, and there appear to be no social sanctions controlling the amount of marihuana an individual may properly consume. Greater understanding of the informal rules, regulatory norms, and contextual expectations in which the use of marihuana is embedded would have relevance for efforts to develop alternative patterns of use more insulated against excessive or abusive practices.

The discontinuation of marihuana use is another topic of special research interest. In the 1977 national household survey, about half of the 26- to 34-year-olds who had ever used marihuana reported no use in the past year (Miller et al. 1978). Whether this reflects the assumption of adult roles and the move out of a context of social support for use (Henley and Adams 1973; Brown et al. 1974), or whether it reflects the fact that the involvement and experience with marihuana was only minimal and experimental in the first place (Hudiburg and Joe 1976), it would seem crucial to establish systematic knowledge about factors conducive to the cessation of use of marihuana. These same factors may also be relevant to insulating against progression from occasional use to excessive use among those who do not discontinue. Longitudinal studies of adult development, with a focus on adult roles in relation to work, family, and childrearing and on adult social support for drug use, should illuminate the circumstances under which discontinuation is likely in that part of the life span.

The final research area that would seem to deserve special attention is that of the role of personal controls in relation to marihuana use. Personal control variables—whether religiosity, moral standards, or attitudes about transgression—were shown to be powerful in regulating whether marihuana use occurred at all, how early, and with what degree of involvement. As marihuana use becomes more widespread and normative, personal controls should come to play the key role in determining whether use remains moderate and regulated or becomes heavy and associated with other illicit drugs. A greater understanding of the nature and role of personal controls, and of their institutional, familial, and interpersonal sources, could conceivably contribute to the shaping of more effective prevention efforts against marihuana abuse.

Despite the importance of continued research on marihuana, it is clear that the kind of knowledge to be gained—as is true of the knowledge already in hand—will not yield univocal implications for social policy in relation to marihuana. Thus, one moves from research to social policy recommendations only with restraint. Nevertheless, in light of the research that has been reviewed and in light of the continuing increase in prevalence of marihuana use, it seems to be counterproductive to maintain its status as an illicit drug. The real problem with regard to marihuana has by now been transformed. Concern with its use should give way to concern with its abuse. But its continuing illicit status constitutes an almost insuperable barrier to educational and intervention efforts aimed at promoting moderate use and at forestalling abusive practices. Unlike the situation in the alcohol field, efforts to promulgate norms and expectations about socially acceptable marihuana practices are precluded, norms about appropriate time, place, and amount, and about inappropriate associated activities such as driving, and the simultaneous use of other drugs. The decriminalization of marihuana would open up opportunities for concerted societal efforts in this direction. Although decriminalization could itself bring a further increase in the use of marihuana, it does not necessarily follow, as Johnston, Bachman, and O'Malley (1978) cogently point out, that the use of other illicit drugs will also increase. They call attention to the fact that the use of other illicit drugs has remained steady among high school seniors at the same time that marihuana use has increased significantly. A similar observation can be made with the data from the annual San Mateo surveys (Blackford 1977). Action to cleave marihuana from the other illicit drugs would seem to be a timely item on society's agenda; it would permit a salutary shift from an unsuccessful policy of prohibition to a policy of regulation that might have greater relevance for the minimization of marihuana abuse.

Policy initiatives in regard to marihuana—even the modest one suggested here—are obviously not easy to undertake given the politicization of the drug field as a whole. Recognition that the policies of the past were not based upon adequate empirical knowledge and therefore could not have been entirely appropriate would seem to be essential to creating a climate for change. Hopefully, this chapter has contributed an increment in that direction.

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33. Drugs and Crime

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INTRODUCTION

The literature on drug use and crime generally deals with (1) evidence of a statistical or associational relationship between the two behaviors, (2) the direction of causality, if any, and (3) the extent to which both drug use and crime are the result of other factors. Obviously, these aspects cannot be meaningfully addressed without specifying the type of drug and the context of use.

This brief review highlights recent literature in two areas, studies examining the question of crime resulting from direct pharmacological effects, and those investigating possible indirect relations between drug use and crime.[1] The latter are further divided into those studies dealing primarily with nonaddictive patterns of use and those involving mainly addictive use—essentially heroin.

Possible direct pharmacological effects include drug-induced disinhibition resulting in impulsive actions, violence caused by drug-related paranoia or psychosis, crimes of negligence such as those resulting from driver-impaired performance, and the occasional references to persons using drugs as a means of fortifying themselves to engage in criminal activities. Hypotheses as to how drug use may indirectly cause or lead to crime are more numerous and less specific. The central theme for one line of reasoning is that the participation in one illicit behavior, drug use, facilitates other deviant activities through associations and opportunity. Obviously, the same rationale can be used to attribute drug use to prior criminal behavior. Drug usage is also hypothesized to lead to crime through drug-induced personality changes and reduced economic opportunities. Drug use may directly affect attitudes, beliefs, and values, or possibly act as a catalyst, making the individual more susceptible to influence from others in a deviant subculture. To the extent that drug use interferes with school or work activities, it may contribute to economic dislocation through the closure of normal job opportunities. In addition, a high rate of violence and homicides is sometimes associated with the illegal drug market. Finally, and perhaps the issue of major concern, is the question of income-generating crime among individuals with expensive drug habits, and the extent to which the crime is caused by the drug costs.

DIRECT PHARMACOLOGICAL EFFECTS

Alcohol is the only drug for which there is sufficient statistical data to establish a causal connection, and the evidence clearly shows a relationship between acute effects and crimes of both violence and negligence (Tinklenberg 1973). Among the other classes of drugs, Tinklenberg concludes that barbiturates seem most likely to potentiate criminal behavior (1973), and this is supported by his study of assaultiveness among adolescent offenders (1974). Malmquist has also found barbiturate use to be associated with adolescent homicides (1971).

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[1] Several more extensive reviews are available (Canadian Commission 1973; Greenberg and Adler 1974; National Commission on Marijuana and Drug Abuse 1973; National Institute on Drug Abuse 1976; Research Triangle Institute 1976).

Amphetamines and cocaine are stimulants whose chronic use in high doses can produce paranoid reactions. Ellinwood (1971) reported on 13 persons who had committed homicides while intoxicated with amphetamines and concluded that paranoid delusions and long-term solitary lifestyles were factors in several of the cases. Overall, however, the literature contains relatively few references to violence attributed to amphetamine or cocaine intoxication (Greenberg 1976).

Marihuana and the stronger hallucinogens are also capable of producing psychotic reactions, and there are occasional references to violent behavior during these episodes. Reports of cannabis-related violence appear most often in the older foreign literature, possibly as a result of the high doses consumed. Overall, the amount of crime resulting from marihuana and hallucinogen-related psychosis is certainly very minimal. Jones concludes that observations and self-reports of laboratory subjects suggest that marihuana typically decreases both expressed and experienced hostility (1977). On the other hand, there is growing evidence that the pseudohallucinogen, phencylidine, has a fairly high potential for producing combative and violent behavior (Burns and Lerner 1976; Rainey and Crowder 1975).

Opiates produce a reliable sedating reaction without the increased emotional lability and aggressiveness accompanying alcohol and barbiturate use (Tinklenberg 1973). There is also little or no tendency to produce psychosis or paranoid reactions. Thus, the direct pharmacological properties would be expected to decrease rather than potentiate criminal behavior, and this is generally consistent with the available evidence. Acquisitive crimes committed while undergoing withdrawal symptoms might be considered a direct pharmacological effect of opiate use, however, this type of behavior will be considered in a later section.

In summary, there is some evidence that drug use contributes to crime directly by potentiating impulsive and violent behavior. However, the overall significance of this source of crime should be considered in the context of that directly resulting from alcohol consumption. While statistics are available only for alcohol, it seems fairly certain that the relative contribution of the other drugs is quite small.

There is limited evidence of the use of alcohol and other drugs to facilitate criminal behavior. Inciardi and Russe (1977) have recently reported on a sample of pickpockets who initiated drug use primarily to reduce anxiety and facilitate performance. Tinklenberg (1973) also found that a minority of adolescent offenders used drugs in this manner, with alcohol and barbiturates being preferred.

INDIRECT EFFECTS: STUDIES PRIMARILY RESTRICTED TO NONNARCOTIC DRUGS

Associational Relations

The middle-class drug epidemic of the 1960s gave rise to numerous drug-use surveys, some of which contained self-report data on crimes, arrests, etc. The most significant cross-sectional survey of this type was that done on a representative sample of 2,500 U. S. males, aged 20 to 30, during 1974-75 (O'Donnell et al. 1976). The data show a clear associational relation between drug use and crime. If the sample is divided on the basis of those having used marihuana (55 percent) versus those never having used (45 percent) the relation to self-reported crime is as follows: breaking and entering, 18 percent versus 6 percent; shoplifting, 56 percent versus 29 percent; armed robbery, 2 percent versus less than 0.5 percent. There is also a positive relationship between crime and amount of drug use, e.g., 10 percent of experimental or light marihuana users reported breaking and entering versus 27 percent of heavy users. Further analyses of these data (Voss 1976) showed a relation between crime and types of drugs used, e.g., only 1 percent of those who restricted their use to marihuana reported committing an armed robbery compared to 11 percent of those having ever used heroin. On the other hand, those using only marihuana still showed more minor criminality than those not using, e.g., shoplifting, 47 percent versus 28 percent.

Other studies which have examined the associational relationship between drugs and crime have yielded similar results (Brill and Christie 1974; Elliott and Ageton 1976; Jacoby et al. 1973; Johnston et al. 1976). Jacoby et al. (1973) interviewed a 1945 male and female birth cohort in Philadelphia and found 63 percent of those having used marihuana had been arrested after age 18 compared to 32 percent for the nonusing group. Controlling for socioeconomic status and race decreased the relation but the difference remained significant. Johnston et al. (1976, 1978) have reported on a representative national sample of 2,200 10th-grade males initially interviewed in 1966 and followed to 1974. They found a strong positive association between increasing degree of drug use and an index of theft and vandalism. The relationship between drug use and interpersonal aggression was also positive but substantially weaker.

Those using only marihuana showed only slightly higher scores on the interpersonal aggression index than did nonusers, however, they were substantially higher on the theft and vandalism scale. Elliott and Ageton (1976) examined drug use and criminal behavior in a probability sample of 8,000, ages 11 to 17, drawn from seven U.S. cities. Again, the amount of self-reported petty theft, grand theft, robbery, and violent crime was substantially greater for drug users than for nonusers.

The Question of Causality

A useful perspective is provided by the O'Donnell et al. (1976) data on alcohol use and crime among their sample of 20- to 30-year-old males. The alcohol no-use category is too small for meaningful comparison; however, the percentages for the light (20 percent of the sample) and heaviest (37 percent of the sample) categories are as follows: breaking and entering, 6 versus 18; shoplifting, 31 versus 56; and armed robbery, 1 versus 2. The corresponding percentages for no marihuana use (45 percent of the sample) and heavy use (20 percent of the sample) are 6 versus 27, 29 versus 64, and less than ½ percent versus 4.

One means of investigating the hypothesis that drug use leads to crime is to examine the temporal order of the two phenomena. Several studies have provided data showing that other forms of deviance most often precede the initiation of nonnarcotic drug use (Friedman and Friedman 1973; Jacoby et al. 1973; Johnston et al. 1978). One problem with this approach is that the order of occurrence may be dependent on the opportunity to use drugs as well as the age at which individuals typically engage in various types of deviance (O'Donnell et al. 1976). Also, while initial drug use is a discrete event, the establishing of the time of onset for delinquency is not nearly so clear. However, there are some longitudinal studies which provide convincing evidence that youth who subsequently become marihuana and other drug users can be predicted on the basis of personality and behavioral measures (Jessor 1976; Kandel et al. 1978; Smith and Fogg 1978). They are generally less conventional and conforming, more rebellious, and more deviant with respect to other behavior prior to initial use. These studies tend to support the hypothesis that both drug use and other forms of delinquency result from a common set of variables.

The one longitudinal study specifically examining the issue of nonaddictive drug use and crime is of the previously mentioned panel of 10th-grade males (Johnston et al. 1976; Johnston et al. 1978). At the time of the initial interview (1966), very few had used illicit drugs. There were four subsequent followups through 1974. The data show "the preponderance of the delinquency differences among the non-users and various drug-user groups existed before drug usage." Analysis indicated that the groups which increased or decreased drug use over the period studied generally did not show parallel changes in criminal behavior. Finally, there was a tendency for both user and nonuser groups to decline and converge on indices of criminal behavior over the period of study. This was especially true for the index of interpersonal aggression. On the basis of their results, the authors reject the hypothesis that nonaddictive drug use causes crime. They consider it more plausible that delinquency leads to drug use through association with a deviant peer group, and that both delinquency and drug use stem from a general proneness toward deviance.

A cross-sectional study by Elliott and Ageton (1976) resulted in somewhat different findings from that of Johnston et al. They found that when the sample was restricted to that segment of the youth population with a significant involvement in delinquency, the use of marihuana did not increase the probability of petty theft, grand theft, robbery, or violent crime; however, the use of hard drugs, or the sale of any drugs, did significantly increase the probability of involvement in these crimes. The relationship between selling drugs (marihuana or hard drugs) and crime was substantially stronger than that for crime and hard drug use.

In summary, most of the available evidence argues against the hypothesis that nonaddictive drug use causes crime, however, some reservations should be mentioned. Clearly, there is an associational relation between crime and even modest use of illicit drugs, but one would expect any causal relation to be largely restricted to those individuals for whom drug use has a major impact. Examples might be those who fail to work or become heavily involved in selling drugs as a direct result of their drug use. Normal population surveys generally employ relatively minimal requirements for inclusion in the "heavy" drug use category, e.g., "more than experimental use of three pills or the use of heroin" in the Johnston et al. study, with experimental use being defined as one or two times. It may be that this definition includes too small a percentage of persons significantly affected by drug use to detect any effect on criminal behavior. It may also be that those persons most heavily involved in drug use are the ones most likely to be lost to followup in longitudinal

357

studies. In any event, it seems fair to conclude on the basis of currently available evidence that nonaddictive drug use does not lead to crime in more than a very small percentage of current users.

INDIRECT EFFECTS: STUDIES EMPHASIZING NARCOTIC USE

The most direct evidence of the criminogenic role of narcotic addiction is provided by the addicts themselves in terms of the self-reported type and frequency of crime committed to purchase drugs (Inciardi and Chambers 1972, McGlothlin et al. 1978; O'Connor et al. 1972). Other ethnographic studies have described these addict hustles and lifestyles in considerable detail (Agar 1973; Smith and Stephens 1976; Waldorf 1973). While this is compelling evidence, it may still be argued that the majority of addicts were involved in crime prior to addiction, and that the observed postaddiction criminality is simply a continuation of this behavior pattern. A related and more plausible argument acknowledges that the onset of addiction leads to increased criminality but contends that the lifestyle of depending on illicit activities continues following the cessation of addiction—hence the elimination of addiction among current users would not reduce the amount of crime committed.

One caveat should be mentioned prior to reviewing the evidence on these issues. Data on narcotic drug use and crime are primarily restricted to criminal justice and treatment populations and thus are not necessarily representative of the overall population of narcotic users. Differences in the characteristics of the various samples undoubtedly account for some of the lack of agreement between studies.

Changes in Criminality Following Addiction

While most studies report over 50 percent of heroin addicts have been arrested prior to addiction, virtually all show a sharp increase in the rate of nondrug arrests and self-reported criminality following addiction (Hayim et al. 1973, McGlothlin et al 1978; Nurco and DuPont 1976, Voss and Stephens 1973; Weissman et al. 1976). Weissman et al. (1976) interviewed a sample of 200 addicts diverted from the criminal justice system and found the postaddiction arrest rate per year for nondrug offenses was 2.5 times that prior to addiction. Respondents were also asked about their own perceptions with respect to preaddiction and postaddiction criminality. The percentages indicating decrease, no change, and increase were 4, 30, and 66, respectively. Hayim et al. (1973) compared arrest rates from age 16 to addiction (average of 5 years) and from addiction to admission in a methadone program (average of 12 years) for a sample of 416. Arrest rates per year for nondrug offenses during the postaddiction period were more than 3 times that prior to addiction. McGlothlin et al. compared arrest rates and self-reported criminality during the 1-year periods before and after addiction for one sample of 420 admitted to the California Civil Addict Program during 1962-64, and for a second sample of 237 admitted in 1970 (McGlothlin et al. 1978). Arrest rates for property crime during the postaddiction year increased by a factor of 1.5 for the first group and 2.1 for the second. The number of self-reported property crimes increased by factors of 2.8 and 1.5, respectively, and income from property crime by factors of 4.3 and 2.0.

There is some evidence that preaddiction nondrug arrest rates for females are substantially lower than those for males but that they become more comparable after addiction (Weissman et al. 1976). Female arrest rates for serious crimes are much less than those for males both before and after addiction.

Types of Crime Committed Following Addiction

A number of studies have utilized self-report or arrest data to examine the types of crimes committed by narcotic addicts (McGlothlin et al. 1978; Nurco and DuPont 1976, Weissman et al. 1976). The majority indicate that shoplifting and other forms of petty larceny are the most frequent nondrug offenses, followed by burglary. Robbery, forgery, and auto theft are less frequent. Since minor theft offenses are less likely to result in arrest than are more serious crimes, the self-report data typically indicate a higher percentage of minor crimes than do arrest statistics. One interview sample of 439 found robbery represented 9 percent of the property crime arrests, but only 1 percent of the self-reported crimes and 2 percent of the income from crime (McGlothlin et al. 1977). By comparison, shoplifting and other minor theft represented 35 percent of the property crime arrests, but 72 percent of the reported crimes and 62 percent of the income.

Several studies have compared addict and nonaddict charges in arrestee samples. The results are uniform in showing addicts to have a higher proportion of property crime arrests and a lower proportion of violent crimes against persons than do nonaddict arrestees. Eckerman et al. (1971) found 24 percent of heroin user arrests were for robbery, compared to 12 percent for nondrug user arrestees. The results were similar for burglary—25 percent versus 10 percent. The comparable percentages for assault were 6 and 22. McBride (1976) found 6 percent of narcotic users were arrested for serious crimes against persons (not including robbery), compared to 16 percent for nondrug users. Kozel and DuPont (1977) reported 7 percent of Washington, D.C. heroin-using arrestees were charged with violent crimes compared to 17 percent for nondrug users. After excluding drug offenses, Barton (1976) found 15 percent of prison inmates with a history of heroin addiction were serving sentences for violent crimes compared to 41 percent for nondrug users.

These findings have sometimes been rather loosely interpreted to conclude that narcotic addicts are less likely to commit crimes against persons than are non-addict criminals. Actually, the data do not warrant conclusions about the absolute frequency of crimes by the two groups. Addicts exhibit an especially high recidivism rate, and the possibility that they commit many more property crimes, and some more violent crimes, than nonaddict criminals is not inconsistent with the above results. A substantial proportion of addicts clearly do not avoid crimes involving potential violence such as robbery—data from arrestee samples show 35 to 45 percent of heroin addicts have a record of one or more arrests for robbery (Eckerman et al. 1976; McGlothlin et al. 1978). In addition, the rate of homicides among addicts is known to be very high, in some populations exceeding those resulting from drug overdoses (Monforte and Spitz 1975; Zahn 1974).

Changes in Criminality Following the Cessation of Addiction

Probably the most frequent approach to examining the relation between heroin addiction and crime is the effect of treatment or other intervention efforts on criminality. A few investigators have attempted to relate changes in heroin use to community crime rates (DuPont and Greene 1973; Maddux and Desmond 1976; Nash 1973; Silverman et al. 1975); however, the inability to control other relevant variables makes it difficult to obtain convincing evidence from aggregate data of this type.

More direct evidence is provided by the extensive literature on the effects of various treatment programs. For the present purposes, interest is primarily restricted to the following question: Given that treatment at least temporarily reduces illicit opiate use, is this also accompanied by a decrease in criminality? The broader question of the overall impact of drug treatment programs on criminality is beyond the scope of the present discussion, and is examined in other chapters on the effectiveness of various treatment modalities. While the posttreatment effectiveness of methadone maintenance may be in doubt, there is no serious dispute that this modality reduces the percentage of time patients use heroin on a daily basis while in treatment. A large number of methadone studies have also reported reduced criminality during treatment (Demaree and Neman 1976; Edwards and Goldner 1975; McGlothlin et al. 1977; Nash 1973; Newman et al. 1973). The primary negative findings are those of Kleinman and Lukoff (1975) in the evaluation of a New York program. Boudouris (1976) has recently reported similar negative results for a second New York program. In the Kleinman and Lukoff study, a mitigating factor may have been the exceptionally low rate of participation—38 percent of all patients failed to obtain their methadone for more than one quarter of the time during their first year in treatment.

There are two major criticisms of studies showing reduced criminality during methadone treatment. The first involves the utilization of relatively short pretreatment baseline periods. Since methadone patients are likely to volunteer or be coerced into treatment during periods of heavy drug and/or legal involvement, both arrests and self-reported criminality are likely to be above normal during the period immediately prior to admission. This tends to bias the results in terms of posttreatment improvement. The second criticism concerns the selective factors related to remaining in treatment. Those continuing in methadone maintenance are likely to be more motivated to change their behavior and may be maturing out of criminality independent of their decreased use of heroin. In spite of these methodological shortcomings, the balance of evidence seems to indicate that criminal involvement is generally suppressed during methadone treatment, and that this is at least partially due to the reduced heroin use and its associated cost.

One means of overcoming the above methodological problems is to examine criminality as a function of heroin use throughout the addiction career. An early study by DeFleur et al. (1969-1970) used this approach for a sample of Puerto Rican addicts, and found the arrest rate while addicted was 5 times that when not addicted. However, the arrest rate included those for drug offenses, and, since the average history of 18 years included intervals after permanent discontinuance of heroin use, it is likely that part of the reduced criminality was due to the average older age during the nonaddicted periods. A recent study avoided these limitations by examining nondrug arrest rates and self-reported criminal behavior as a function of frequency of narcotic use during the addiction career (first daily use to last daily use) of a sample of 690 admissions to the California Civil Addict Program (McGlothlin et al. 1978). Thirty-five percent of the addiction career nonincarcerated time involved less-than-daily or no narcotic use. During these periods, arrest rates for property crime were less than one-half that for addicted periods, and the reduction in the number of self-reported crimes and illicit income was even more pronounced.

The latter approach avoids most of the methodological problems encountered in the preaddiction and postaddiction, as well as the pretreatment and posttreatment, studies. In particular, the confounding effects of age are avoided—both the problem of being on an increasing slope of criminality at the initiation of addiction and that of simultaneously maturing out of both addiction and criminality in the later phases of the career. Concern is limited to whether, within the addiction career interval, the individual is involved in more criminality during periods of addiction than for periods of nonaddiction.

In summary, the career history studies, together with the methadone maintenance results and the earlier findings of increased criminality following the onset of addiction, provide fairly strong evidence that narcotic addiction causes an increase in the amount of crime committed. Much of the debate on this issue has centered about the question of whether addicts are or are not criminals before and after addiction, or treatment, etc. In view of the available data, it appears more meaningful to describe the criminal activities on a continuum of frequency or amount. Using these measures, there seems to be little question that narcotic addiction increases the frequency of income-generating crime for those individuals using this means of acquiring heroin.

IMPLICATIONS FOR FUTURE ACTIVITIES

Research

The understanding of the relation between nonnarcotic drug use and crime could be strengthened by additional longitudinal surveys coupled with a career-history approach for the relatively small proportion of very heavy users. The longitudinal survey of drug use and criminal behavior in the normal population is methodologically strong but is not well adapted to identifying the extreme cases which would be most likely to exhibit a causal relationship. Supplementing the survey approach with a career study of very heavy users would help overcome this limitation.

As has been previously suggested by Inciardi (1976), reasonably good estimates of the extent of crime committed by opiate addicts in a given community can probably be obtained through a combination of victimization data and information on the proportion of property crime committed by the addict and nonaddict criminal populations. Inciardi suggests that the latter data be obtained via self-report of representative samples of the two groups; however, a more readily available source is the ratio of heroin users to nonusers for various offenses in arrestee populations as determined by urinalyses and/or interview. A limiting assumption here is that offenses by addicts and nonaddicts are equally likely to result in arrest. Victimization data should include estimates of losses from shoplifting and other theft from businesses not normally obtained in household surveys.

A general comment on the collection of data on narcotic use and crime concerns the advantage of direct over indirect approaches. Establishing individual periods of addiction and nonaddiction and obtaining data on arrests and self-reported crime for these intervals will help avoid complicating assumptions. Determining the cost of drug use and the specific method of obtaining the funds is even better. Attempting to study addiction and crime via an intervening variable such as exposure to drug treatment is much more likely to encounter methodological problems.

Treatment and Control

Income-generating crime required to support drug use is primarily associated with daily heroin use. The finding that even temporary interruption of daily-use patterns tends to be accompanied by reductions in the amount of associated property crime suggests that measures aimed at limiting the extremes of narcotic usage can be successful in minimizing the social costs of addiction. This aspect is discussed more fully in the chapter on criminal justice clients.[2]

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[2] See W. H. McGlothlin's "Criminal Justice Clients," this volume.

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epidemiological studies

Up until recent years, the drug problem in the United States was seen as the problem of opiate addiction, and it seemed to be a problem here and in some exotic places like Iran and Hong Kong and Singapore, from which we had little to learn. Other countries had drug problems too, but they were drugs about which we were not greatly concerned. But today opiate addiction is much more widespread, and we are concerned about other drugs too. This section therefore includes two chapters on the international scene, Hughes on epidemiological studies and Ball on treatment programs.

Large-scale epidemiological studies of drug use (aside from alcohol) are recent in the United States. Parry reviews three national surveys, of which two have been repeated several times, so that changes across time can be estimated. Hunt's chapter discusses the definitional—and practical—problems of such surveys, and proposes a new mathematical tool for arriving at estimates. What seems to be needed next is some independent measure of prevalence to judge the accuracy of these estimates; as Hunt points out, the use of mathematical procedures requires strong assumptions about the reality to which the procedures are applied, and the scientific question is whether or not these assumptions are justified.

34. An International Overview–The Treatment of Drug Abusers

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INTRODUCTION

Despite increasing interest in the international aspects of the drug abuse problem, our knowledge of the contemporary treatment response of nations throughout the world is fragmentary. This uneven and uncoordinated state of our international medical and scientific knowledge pertaining to treatment of drug abusers is related to three general factors: (1) the widespread introduction of new Western therapies in the treatment of drug abuse, (2) the extreme difficulty of obtaining comprehensive and valid information in many nations, and (3) the cultural and communicative impediments to comparative international research.

The fragmented state of our international knowledge pertaining to drug abuse treatment is reflected in the scientific and medical literature. Thus, most studies refer to a single nation, province, or city; report on a single treatment program or type of drug abuse; and employ an improvised research methodology. Consequently, it is often difficult and sometimes impossible to obtain an accurate and comprehensive view of the treatment which is available in a given nation.

Still, it should be noted that our knowledge of drug abuse treatment programs in particular countries varies considerably, from rather complete and extensive reports in some nations to meager or inadequate information in others. The state of medical and scientific knowledge pertaining to drug abuse and its treatment in a particular nation tends to be influenced by the state of economic development of the nation, extent of its drug abuse problem, and the available resources which are provided for treatment. Thus, while the Western industrialized nations predominate in the scientific literature, developing nations with a sizable drug abuse problem—Iran, Hong Kong—are rapidly expanding both their treatment capability and related knowledge. In underdeveloped nations, both drug abuse treatment and knowledge of their problem may be minimal.

INTERNATIONAL TREATMENT ISSUES

A wide range of controversial issues pertaining to the treatment of drug abusers is to be found in the international literature. The issues range from the efficacy of acupuncture to the appropriateness of individual and group psychotherapy in the treatment of drug dependent persons (Lau 1976; Harding 1975).

Although a complete listing of the drug abuse treatment issues which have received some attention in the international literature would be lengthy and unmanageable (were it possible to effect), certain issues have received rather widespread discussion and study. It seems appropriate to state 10 dominant treatment issues and provide relevant citations:

1. On diagnosis or etiology. Is drug dependence an identifiable disease or a type of deviant behavior? (Ball et al. 1975; Bejerot 1975a; Evang 1975)

2. What are appropriate treatment aims? Abstinence from drugs? Social or personal rehabilitation? (Brook and Whitehead 1973; DuPont 1977; Sjöberg 1975)

3. What should be the role of physicians—and psychiatrists in particular—in drug treatment

programs? (Chopra and Chopra 1965; Connell 1977; Harding 1975)

4. How best can drug abusers who need treatment be identified and diagnosed? (Bejerot 1975a; Evang 1975)

5. Is voluntary or compulsory treatment of drug abusers more effective? For which type of drug abusers? (Ministry of Health and Welfare 1975; Garner 1976; Showanasai 1977)

6. For what types of patients is methadone maintenance an appropriate mode of treatment? (Connell 1975; Graff and Ball 1976; Harding 1975)

7. What types of special treatment facilities are needed in treating youthful drug abusers? (Brook and Whitehead 1973; Evang 1975; Retterstöl 1975)

8. Should persistent criminals who are drug abusers be enrolled in treatment programs or in penal programs? (Garner 1976; Sjöberg 1975)

9. What type of aftercare services should be provided for drug abuse patients after they leave treatment? (Abeywardena 1974, Tating 1977)

10. How can specific treatment modalities be scientifically evaluated? (Bejerot 1975b; Bewley 1975; Moser 1974)

TREATMENT PROGRAMS IN 25 NATIONS

Viewed internationally, what is the present state of drug abuse treatment?

In a recently published study (Ball et al. 1977), information was obtained from a prominent physician or scientist in each of 25 nations concerning the treatment which was available to drug abusers in his nation. Table 1 summarizes the treatment available for opiate addicts in these 25 nations (in most of these nations, opiate abusers constituted the majority of the patients in treatment).

TABLE 1.—*The abuse of opiates in 25 nations (1975)*

Nation and Population (in millions)	Principal Opiate	Opiate Pts. in treatment	Methadone Maintenance	Population of Opiate Addicts	Opiate Addicts pct. Male	Current Trend, Opiate Prevalence
1. Canada (22.7)	Heroin	1,100	981 pts.	18,000	75	Marked increase
2. U.S.A. (212.8)	Heroin	170,000	76,800 pts.	620,000	74	Increasing
3. Mexico (58.1)	Heroin	No Data (ND)	no	ND	88 (all pts.)	ND (no data)
4. Colombia (24.0)	"Narcotics"	a few	no	ND	80	ND
5. United Kingdom (55.9)	Heroin	2,000	yes	6,000	80	10% per yr. Increase
6. Sweden (8.2)	Morphine base	1,800 beds (all drugs)	15 pts.	11,000 IV users[1]	75	Increasing
7. Denmark (5.1)	Morphine base	5,500 (all drugs)	yes	ND	75	Increasing
8. Italy (55.6)	Heroin	1,500	Has begun	10,000	80	Marked increase
9. Poland (33.7)	Morphine	ND	no	ND	63 (all pts.)	Minor problem
10. Hungary (10.5)	Morphine	a few	no	30-50	ND	Minor problem
11. Switzerland (6.5)	Heroin	a few	no	small	ND	Minor problem
12. Nigeria (79.8)	Pethidine	ND	no	few	ND	No Opiate problem
13. South Africa (24.9)	Heroin?	a few	no	ND	75	Minor problem
14. Israel (3.3)	Opium	180	2 Ctrs.	1,650	85	Increasing
15. Turkey (36.3)	ND	270 beds (all drugs)	no	ND	ND	Minor problem
16. Iran (32.0)	Opium	910 beds	Beginning	400,000	ND	Decreasing
17. Pakistan (68.2)	Opium	60	no	ND	90	Opium eating problem
18. India (586.3)	Opium	ND	yes	ND	90	ND
19. Burma (29.6)	Opium	ND	no	ND	98	Registration underway
20. Thailand (41.0)	Heroin	1,450 beds	yes	350,000	90+	Increasing
21. Singapore (2.2)	Opium	300 beds	no	13,000	96	Increasing
22. Hong Kong (4.3)	Heroin	2,000	yes	80,000	96	Increasing
23. Japan (109.7)	Heroin	14 Pts.	no	250	64	Decreasing
24. Australia (13.5)	Heroin	1,100	30 programs	12,500	70	Marked increase
25. Philippines (41.5)	Heroin	1,400 (all drugs)	no	ND	90	Decrease since 1972

[1] 11,000 IV users of all drugs.

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Analysis of the treatment information from the 25 nations revealed that Western treatment modalities were spreading to Asia, the Far East-Pacific, and Latin America. In addition, there was an increased awareness by the government of the drug abuse problem in most of these nations along with a corresponding increase in the number of treatment programs.

The following abstracted information from four of these nations is presented to elucidate and document the growing impact of Western drug abuse therapies and the increasing role of many governments in providing drug abuse treatment.

From Iran, Dr. Javad Razani (1977) reports on the scope of his nation's drug abuse problem and the governmental response:

> Drug abuse in Iran is of particular interest for several reasons. First of all, until recently, the extent of addiction in the country was staggering. In 1955 it was estimated that there were 1.5 million addicts—roughly 7 percent of the population. This number was reduced to approximately 400,000, or 1 percent of the present population, between the period of 1955 (when the use of all narcotics except for medical treatment was outlawed) and 1968. Since 1969 the use has been sanctioned by law for individuals 60 years of age or older and also for those suffering from chronic and serious conditions for whom detoxification is deemed dangerous by a tribunal of doctors.
>
> The principal addiction problem in Iran involves opium, shireh, and heroin abuse. Thus, treatment programs have been set up to treat opiate users. Treatment and rehabilitation of addicts gained a new momentum when the Ministry of Social Welfare took charge of the program in 1974. There are now three governmental departments with treatment programs for addicts, although an additional number of addicts are treated through private channels.
>
> By far the largest organization in charge of treatment is the new Ministry of Health and Social Welfare. It has centers for treatment and rehabilitation of addicts with a variety of modalities of treatment, not only in Tehran but in major provincial capitals. The other two government programs are run by the Department of Prisons and the armed forces. The Department of Prisons has centers for detoxification of addicts who are placed in prison, and these centers also are in Tehran and some other major cities. In the armed forces, each major branch (Army, Air Force, and Navy) has detoxification and follow-up facilities at some of the general hospitals which are operated by that branch.
>
> The Ministry of Health and Social Welfare has up to now (mid-1976) seven hospitals for detoxification of addicts. Some of these hospitals have additional facilities for rehabilitation and follow-up facilities, but most are short-term detoxification centers on an inpatient basis.

In Burma, Dr. Ne Win (1977) comments upon their registry system for encouraging drug abusers to seek treatment and reviews current drug treatment programs:

> The Narcotic Drug Act, passed in February 1974, requires that all persons dependent on narcotic drugs must register at the specified centers with the Health Department to receive appropriate treatment. Up to this time (1975), approximately 1,300 persons are already registered. The majority are male and only about 1 to 2 percent are females.
>
> It has been estimated that there are about ten times more drug-dependent persons than those actually appearing for registration. This number would include those habituated to marihuana.
>
> The main problem has been the use of opium, particularly in those areas where the opium poppy is being illegally grown. The government is making all-out efforts to banish this cultivation. Recently, the use of heroin has been spreading in the urban areas, particularly the larger cities, such as Rangoon and Mandalay. The influx of tourists from other countries play some part in this increase.
>
> The majority of drug-dependent patients are treated in special units in divisional hospitals, township hospitals and other general hospitals. A special unit has been opened at the Rangoon Psychiatric Hospital, and the hospitals in Myitkyina and Taunggyi.
>
> The main type of treatment utilized for opiate detoxification is gradual withdrawal, using opium at first. Recently the trend has been changed, and this type of treatment is rarely used; abrupt withdrawal is instituted with the help of tranquilizers. More recently, the use of methadone has been introduced for withdrawal, but it has not been used for maintenance therapy. The duration of treatment with methadone is approximately two weeks. The patients are kept in the hospital for about six to eight weeks before discharge and are continued as outpatients.

> Meditation therapy and acupuncture therapy have been tried but their success has not yet been evaluated.

From Australia, Dr. David S. Bell (1977) reports on the development of new public health treatment programs, including the prominent role of methadone maintenance in the outpatient treatment of opiate abusers.

> By 1975 most of the public health administrations in each state had created some authority entrusted with developing programs for the treatment of drug dependence. In most states the emphasis has been on providing hospital based and oriented units in the largest cities, but the number of beds provided is small. In Sydney, a city with almost three million inhabitants, possibly no more than 40 public hospital beds are occupied by addicts, and perhaps an equal amount used in private hospitals. Voluntary and church bodies in each state have only just begun to extend their aid, moving out of their traditional preoccupation with the alcoholic and the homeless man.
>
> Methadone programs have developed in all states and, of course, are run on an outpatient basis. In new South Wales the emphasis has been on developing facilities in existing community care clinics, using ex-addict counselors as well as interested professional staff. About 30 units in metropolitan and county areas were functioning by the end of 1975.

Finally, from Poland Dr. Adam Bukowczyk (1977) comments upon the recent appearance of a significant nonnarcotic drug abuse problem and the establishment of specialized treatment for these patients:

> The phenomenon of drug abuse in its modern form came to Poland later than in some developed countries of Western Europe or the U.S., and its frequency has never achieved the levels observed in these countries. In 1971-1972 an increasing trend of drug abuse was noted. It has only been since that period that treatment programs have been in operation.
>
> Drug abuse in Poland does not constitute a serious social problem, although there are some people in the country who abuse various drugs or are drug-dependent. The absence of a major problem is probably due to the wide range of preventive measures undertaken by governmental institutions with regard to control of prescriptions and pharmacies as well as with respect to restrictions in the distribution of drugs.
>
> The principal drugs of abuse are amphetamines, barbiturates, some tranquilizers (e.g., Librium, Valium, meprobamate), phenacetin, analgesics, Percodan, and morphine.
>
> There are some 12 specialized units in Poland providing services for drug abusers and drug-dependent persons. These include hospital wards and outpatient clinics. Drug-dependent people may also be admitted to general psychiatric outpatient clinics.

TREATMENT, RESEARCH, AND POLICY IMPLICATIONS

The knowledge derived from drug abuse treatment programs in other nations can have decided relevance for the United States. With respect to treatment, the experiences of other nations can serve as a natural laboratory in which the efficacy of specific programs with regard to designated patient populations is studied. This line of inquiry could provide useful insights and data concerning the fundamental issue of determining which types of treatment are effective for particular types of drug abusers.

International drug abuse treatment data also have far-reaching research implications with respect to our problem in the United States. For drug abuse is not only entwined with ethnic and minority group culture, but its etiology and natural history involve group and subcultural support and reinforcement. Thus, international research findings can provide not only answers as to the personality, social, and cultural factors associated with various types of drug abuse, but can provide a data base from which to assay the relative impact of planned and unplanned remedial influences.

Finally, international treatment efforts and experiences in diverse nations can have particular significance with respect to formulating drug abuse policy in the United States. For we now know that effective drug abuse policy must be comprehensive in scope and impact; it should include consideration of the population at risk and the appropriateness of both prevention and control programs, as well as the immediate and long-term consequences of treatment. In this context, the contribution of an international treatment perspective is invaluable.

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35. International Issues–Epidemiology

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The collection of epidemiological data on drug abuse has received increased emphasis by international organizations during the past 5 years. In addition to the work of the World Health Organization (WHO), the activities of the United Nations Division of Narcotic Drugs, the United Nations Educational, Scientific, and Cultural Organization (UNESCO), United Nations Social Defense Research Institute, and the International Council on Alcohol and Addictions are all contributing to a worldwide improvement in the quality of epidemiological information on drug abuse. These efforts have been stimulated by a general increase in concern about the problem and in many cases by financial support from the United Nations Fund for Drug Abuse Control (UNFDAC). In this paper I will describe some of these activities and address several emerging issues.

THE WHO RESEARCH AND REPORTING PROJECT ON THE EPIDEMIOLOGY OF DRUG DEPENDENCE

In 1975, WHO implemented the Research and Reporting Project on the Epidemiology of Drug Dependence with the financial assistance of UNFDAC. The objective of the project is to strengthen the planning of prevention and treatment programs through international collection and exchange of data. Because WHO does not have the resources to implement large scale epidemiological studies in all countries requiring them, the emphasis in such international projects is to develop basic methodologies, that is, the operational instruments and procedures to meet priority data collecting needs of planners. After the methodologies are tested and finalized in a small number of countries, they are made available to all governments and investigators for application. If they are widely adopted, they are expected to improve the international comparability and scientific quality of data generated. In selecting collaborating institutions, priority was given to those opium-producing and opium-using countries of the Middle East and Southeast Asia where WHO is cooperating with governments to implement country programs for drug abuse prevention and treatment. These programs generally have training, treatment, and laboratory components, with epidemiological and treatment evaluation activities carried out in collaboration with the Research and Reporting Project.

Three collaborative instrument development projects were completed in 1977. The first involved the testing of a common case reporting form for drug users. It contained core demographic and drug use pattern items previously agreed by collaborating investigators to be the minimum essential data required by planners of treatment and prevention programs. Reports on 300 cases from each of six countries has generated for the first time comparable cross-national data on samples of drug users with different cultural backgrounds and patterns of drug use. Selected analyses of the data, along with the tested instruments, are being prepared for publication in the final study report.

Of more fundamental importance than the data generated was the adoption of a common set of data items for measuring drug use patterns. While not essential for independent investigations, one of the crucial issues that must be resolved in establishing international epidemiological reporting systems for any disorder is agreement on criteria for defining a case of the particular condition being measured. Otherwise there is no assurance that investigators in different parts of the world are studying the same phenomena. Once this agreement is reached, a variety of operational instruments can be generated and applied for use in different approaches and for different populations.

Drug use pattern information, that is, the drug, duration, frequency, and route of use, can be collected from most individuals either on self-administered questionnaires or in interviews by nonspecialized personnel. Drug use patterns can often be validated by relatively simple methods, such as testing urine for drugs, direct observation of use, physical signs on medical examination, and checking of arrest records for drug use or possession. The availability of a "disorder-producing agent" or drug permits epidemiological collaboration in this field to depart in a fundamental way from international studies of functional psychiatric disorders, which have emphasized the collection of data on psychiatric symptoms, mental status and, at times, formal psychiatric diagnosis of each case by highly trained professionals.

A second study involved the testing of a self-administered student survey questionnaire containing comparable data items to those just mentioned. The results of instrument testing in nine countries revealed high test-retest reliability of the drug use pattern questions. An important conclusion of this study is that while the relatively inexpensive self-administered student questionnaire survey is likely to reach the majority of at-risk youth in industrialized countries, the majority of adolescents in developing countries are often not in school. Furthermore, the most serious forms of youthful drug dependence often occur among urban youth from the lower socioeconomic classes who rarely have the opportunity to attend educational institutions. For these reasons, a study is being planned to develop methods for surveying nonstudent youth in developing countries.

The third collaborative study in 1977 involved the testing of treatment assessment instruments on samples of patients assigned to pilot evaluation studies and clinical trials. The instruments again resulted from agreement on core baseline and progress measures of relevance to assessment of most treatments in most settings, for example, continued drug use. A review of the results in five countries permitted these instruments to be modified for final testing in expanded evaluation studies in 1978.

With the publication and application of these tested instruments, WHO and experts from interested countries will have a common framework for planning and communicating with one another in their epidemiological and treatment evaluation activities. In addition, the WHO collaborative network now has the basic tools to implement more complex data collecting activities in the next phase of work, such as the development of methods to permit the impact of treatment and other intervention programs to be measured in preintervention and postintervention surveys in target communities.

The coming into force of the Convention on Psychotropic Substances has given additional stimulus to epidemiological studies in calling upon WHO and its member states to assess the social and public health problems associated with the use and abuse of psychotropic substances. In 1977 the WHO Expert Committee on Drug Dependence (WHO 1978) reviewed mechanisms by which epidemiological data on social and public health problems can be used in scheduling psychotropic substances for national and international control.

DATA COLLECTING ACTIVITIES OF THE UN DIVISION OF NARCOTIC DRUGS (UNDND)

Governments which are party to the International Drug Control Treaties are obliged to furnish annual reports to the United Nations on drug abuse, including extent, patterns, and trends; and on illicit trafficking, including drug seizures and drug-related offenses. The reports include measures undertaken to reduce the demand for drugs, such as preventive measures, treatment, rehabilitation, and research. This information is reported according to a standard format and analyzed by the UNDND for regular reports to the UN Commission on Narcotic Drugs, where representatives of governments which are party to the treaties consider these and other matters relevant to their implementation.

In 1977, the report included information from approximately 130 states (United Nations Commission on Narcotic Drugs 1977). It was based upon 1975 information received in 1976 and presents drug abuse trends by country and by region. Worldwide trends included widespread use of cannabis, increasing multiple drug abuse, and increasing psychotropic drug abuse, including amphetamines, hallucinogens, tranquilizers, barbiturates, and sedative hypnotics, particularly methaqualone. On the regional level the trend in Africa was widespread cannabis use, with few reports of "hard" drug use, such as cocaine and opiates. In the Americas, stabilized opiate abuse was reported in North America, a stationary pattern of coca use in some Andean countries, and a rapid increase in the use of methaqualone. In Asia and the Far East there was increasing spread of heroin abuse among young males, continued opium abuse by older rural and urban populations, and increasing use of psychotropic drugs. In Eastern Europe there appeared to be minimal drug abuse, but in Western Europe it was spreading in countries not previously affected, such as Italy, Portugal, and Switzerland, with increasing injection of drugs in Italy and Switzerland. The Near East and Middle East reported traditional patterns of eating and smoking opium by adults and the elderly in Afghanistan, Iran, and Pakistan, with the abuse of heroin limited to Iran. In the Western Pacific the trend was increasing multiple drug use by young people.

When these drug abuse trends are combined with the UNDND report on illicit traffic and with the International Narcotics Control Board statistics on the movement of legitimate narcotic drugs, a broad worldwide view of drug abuse is possible. Nevertheless, to improve the quality of government reporting, the UNDND has drafted two manuals to assist governments to assess drug abuse. One deals with the reporting of existing data and the other describes the use of survey methods. They are being used in pilot studies in several countries.

DATA COLLECTING ACTIVITIES OF OTHER INTERNATIONAL ORGANIZATIONS

UNESCO is concerned primarily with the preventive education aspects of drug abuse, especially in youth, and collaborated with the Dangerous Drugs Board of the Philippines in 1976 to conduct a survey of young people from the 10 major regions of the country (Cudal 1976). The 3,922 respondents ranged in age from 13 to 23, and 55 percent were students. Findings were consistent with reports of declining drug use in the Philippines in the period following introduction of martial law in the early 1970s. Although 21 percent reported alcohol use and 21 percent reported use of minor analgesics for headaches, colds, and coughs, only 3 percent reported use of prohibited drugs—mostly marihuana. The survey generated valuable information on the attitudes and knowledge of young people about drug abuse to assist the planning of a national drug abuse prevention program. A second UNESCO supported survey of 569 secondary grade students and 505 employed youth was carried out in Thailand. For students the sampling method and instrument were the same as those used in a 1972 survey of 533 students. The results indicated an increase in the use of prohibited drugs from 30 percent to 37 percent during the 4-year interval, with greater increase in the use of barbiturates, heroin, and LSD.

The Rome-based UN Social Defense Research Institute (UNSDRI) initiated a country studies program in 1972. The objective was to facilitate studies of drug abuse in a selected number of countries to yield information for guidance of policymakers. Participating investigators were provided general guidelines for conducting studies of incidence and prevalence of drug use and the characteristics of users, of public and official attitudes toward drug abuse, and of social mechanisms for intervening in drug-related problems. Three countries participated in the study and in each case different populations were studied. In Mexico City a general population survey was carried out on a sample of 595 subjects stratified by income level. In Puerto Rico the investigator analyzed various direct and indirect indicators for estimating the prevalence of heroin users. In Italy a survey of university students collected information on the patterns of drug use, peer group dynamics, and current motivations for drug use. Because different instruments and methods were used in each of the countries, the data are not comparable. Nevertheless, the published report of the studies (Moore 1976) represents one of the important first steps in cross-national epidemiological research in drug abuse.

The International Council on Alcohol and Addictions (ICAA) is a nongovernmental organization which sponsors meetings for administrators, clinicians, and researchers concerned with the problem of alcohol and drug dependence. These meetings provide a forum for investigators to present the findings of epidemiological and other research and they are published in the proceedings of the meetings. In addition, the ICAA has initiated a study of drug use patterns in some African countries.[1] A common questionnaire is being used in four African countries in 1977 and 1978 to determine incidence, prevalence, and patterns of drug use in various populations. A three-nation study of drug abuse among students is also being carried out in India, Iran, and Malaysia.

SEVERAL EMERGING EPIDEMIOLOGICAL PATTERNS

Unpublished data from the WHO Research and Reporting Project, the UNDND, and other sources, indicate significant spread of heroin dependence among urban youth in a number of Southeast Asian and Western Pacific countries during the early 1970s.

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[1] E. Tongue 1977, personal communication to M. I. Soueif.

despite a number of countermeasures. For example, the death penalty has been introduced for serious drug trafficking offenses in the ASEAN countries, that is, Indonesia, Malaysia, Philippines, Singapore, and Thailand. The rapid development of these relatively large heroin-dependent populations represents not only a serious threat to the young people and communities directly affected, but it also provides a large demand for illicit opiates. This complicates current national and international efforts to control illicit opium production and traffic in the region. Fortunately, the common threat is recognized and many countries have established close regional cooperation, not only to control illicit production and traffic but also to share technology in treatment and research. Given certain similarities between these young urban heroin users and those of Europe and North America, there may also be a basis for productive collaboration outside the region with professionals of industrialized nations for mutual improvement of treatment and other approaches.

Of related interest are the data being generated, in collaboration with WHO country programs for drug abuse, on the epidemiology of drug use in rural opium-producing regions of Asia and the Middle East. These populations are of particular importance to the international drug control effort because they are not likely to stop growing opium while they remain drug dependent. A high percentage begin and continue to use the drug as self-medication for pain, diarrhea, and other health problems (Charas et al. 1977a; McGlothlin et al. in press). The preliminary data also suggest that many rural opium users would like to rid themselves of drug dependence and some even travel great distances to treatment centers. When they return to their villages, however, their pain and other health disorders recur and many relapse to opium use (Charas et al. 1977b). These initial data suggest that an important element of prevention in such settings may be the introduction of primary health care programs to offer alternatives to opium for analgesia and other basic health needs. In an effort to further clarify these issues, WHO is planning a meeting of key professionals involved in the concerned countries to review existing knowledge on the most effective epidemiological and intervention approaches for programs in rural opium-using communities.

Another important epidemiological pattern was observed in Hong Kong in the late 1940s and in Iran (McLaughlin and Quinn 1974) and Thailand (Charas 1977c) in the late 1950s, when measures were taken to ban traditional opium smoking and eating. While some opium users were able to free themselves of their habits, many were not. They simply converted to heroin, which is less bulky and more suited to illicit traffic. Fearing that this historical pattern may be repeated, national and international planners are moving cautiously in suppressing legitimate opium use in such countries as Pakistan. What is the net gain if a large segment of the drug-dependent population goes underground and engages in potentially more damaging patterns of abuse, with all the secondary effects of criminalization? Some planners feel that the transitional strategy adopted by Iran, that is, the registration and maintenance of older and medically disabled addicts on government controlled opium, may be a realistic intermediary stage. Theoretically, this large opium-dependent population, as its age increases, should gradually disappear. But this approach is not without difficulties. For example, how do you prevent diversion of opium to nonregistered users?

In South America a new and serious pattern of drug use has appeared in the past several years. This is the rapid spread of coca paste smoking among urban youth in countries near the coca leaf growing regions of the Andean mountains. Coca paste (cocaine sulfate) has been available for decades as an intermediary substance in the preparation of cocaine hydrochloride. Apparently it was never abused because when sniffed it produces necrosis of the nasal septum, and it contains too many impurities for injection. However, during the late 1960s and early 1970s, young drug users from all over the Americas visited the coca growing regions and discovered that coca paste could be mixed with cannabis or tobacco and smoked like a marihuana cigarette. The production of coca paste does not require the relatively sophisticated laboratory procedures and equipment needed to produce cocaine hydrochloride. It is, therefore, much less expensive and rural producers are less dependent upon organized drug traffickers to market their products. Because the smoking of coca paste produces intense euphoria, it has spread rapidly among drug-using youth of countries in the region. Tolerance develops rapidly so that some users quickly develop $50 to $100 per day habits and begin to steal from their families. The tendency for users to steal to obtain money for drugs, and the tendency of dealers to arm themselves for protection against the users who crave the drug, are ominous signs that a criminal subculture is developing similar to that associated with heroin abuse. The problem has already reached serious proportions and there are no signs that the spread of this drug use pattern has stabilized.[2]

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[2] F. R. Jeri, C. Carbajal, C. C. Sanches, T. Del Pozo, and M. Fernandez. "Further experience with the syndrome produced by coca paste smoking." Unpublished paper 1977.

IMPLICATIONS

Research

The past 5 years have seen a rapid proliferation of epidemological studies in parts of the world where systematic data on drug abuse did not previously exist. Efforts are being made by some international organizations, such as WHO and the UN Division of Narcotic Drugs, to establish the principle of comparability of core items in their data collecting activities. Investigators planning new studies are encouraged to consider the advantages of employing already tested instruments and of generating data that can be compared with those of investigators in other countries.

When the current emphasis upon instrument development and upon the sheer feasibility of such studies has passed, it will be important to focus epidemiological research resources on the most important national and international priorities for data collection. One considers here the establishment of national drug abuse case reporting and monitoring systems, and of preintervention and postintervention surveys of high drug use communities scheduled for intervention programs, such as some rural opium-using communities in Asia and the Middle East.

While the multiple drug use epidemic of the late 1960s and early 1970s in North America may now be stabilizing, serious drug epidemics continue to occur in other parts of the world, for example, the spread of heroin in some Southeast Asian countries and the spread of coca paste in Latin America. We are likely to continue to see equally serious drug epidemics until concerted efforts are directed at the study of their etiology, their course, and their termination. Research on the dynamics of drug epidemics and the testing of strategies for rapid and effective intervention should receive high priority during the coming 5 years.

Treatment

Evaluation data for drug dependence treatment methods exist, with few exceptions, only for treatments offered in industrialized countries. While this knowledge is extremely valuable, its relevance to developing countries is not clear. In addition, the results of treatment in industralized countries are generally not encouraging enough to argue for the transfer of this technology. With the anticipated expansion of experimental treatment services in developing countries during the coming years, it is likely that we will see the testing of a wide variety of existing therapies, as well as entirely new approaches that are more culturally relevant than those of the industrialized world. When we consider the large drug-dependent populations in some countries, many in rural locations with minimal resources for treatment and rehabilitation, promising indigenous therapies will have to be carefully evaluated, and particularly low-cost practical methods that can be applied on a large scale. Some potentially feasible approaches are beginning to emerge, for example, the Iranian system of opium registration and maintenance for elderly and medically disabled addicts. There is also the Tham Krabok Buddhist Monastery treatment program in Thailand, which withdraws approximately 5,000 opium and heroin addicts per year, at a cost of approximately $1 per day over a period of 2 weeks. In Indonesia there have been experiments with the withdrawal of young opiate users at home, under the supervision of their families and physicians. These and other culturally relevant and low-cost management techniques should be carefully evaluated, as well as other similarly promising methods.

Prevention

WHO epidemiological data collecting activities on rural opium users of Asia and the Middle East suggest the most common reason for initiating and continuing opium use is the management of pain and other health problems. This suggests that a primary health care system in these regions may be necessary to manage the existing cases and to help prevent new cases. It is recognized, of course, that the introduction of primary health care does not alter other important etiological factors, such as drug availability and integration of opium use into the social and economic structures of these communities. To alter these factors, community education, crop replacement, and integrated rural economic development programs appear indicated.

Training

Despite the dramatic growth in expertise in the research and management of drug dependence in industrialized countries during the past decade, there is some question about the applicability of this expertise in developing countries. It is clear that technology developed in Chicago, London, or Stockholm cannot be transferred to rural mountain regions of Afghanistan, Burma, or Peru. Yet certain tools, such as simple case reporting systems, thin layer chromatography methods for testing urine for drugs, and other practical technology may have direct applications in such settings. Mechanisms need to be established to examine how the transfer can be made and how experts from the industrialized countries can contribute to program development in these settings. To flood developing programs with sophisticated technologies and expertise would be counterproductive. The process must be gradual and parallel to the development of expertise and program infrastructure in the countries involved. This type of expertise does not develop so much from formal training courses as from interaction with knowledgable colleagues and experts during the course of planning and implementing clinical and research programs and collaborative studies.

One mechanism used by WHO for facilitating the rapid development of local expertise in country programs has been to involve epidemiologists and clinical researchers who have been effective in other fields, even though they may not be behavioral or social scientists. The general methodologies for carrying out surveys or evaluating treatment in the field of drug dependence are not really so different from the methodologies for carrying out similar work in other fields. The specific drug abuse content can often be acquired in a short period of time. Such experienced professionals require relatively brief training experience to become familiar with basic methods that are found to be practical in most settings. Training programs for such individuals should therefore not emphasize work with sophisticated, expensive, and highly specialized methods.

CONCLUSION

The work of the World Health Organization, the United Nations, and other international organizations during the past 5 years is contributing to the development of strong clinical and research teams in the developing world and to the application of tools and organizational frameworks for international collaboration in the field of drug dependence. The next 5 years should see the productivity of these efforts in comparability of epidemiological data and improved knowledge on drug abuse problems not previously studied.

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36. Sample Surveys of Drug Abuse

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The data to be reported and analyzed in this chapter derive from three separate sample surveys of nonmedical drug use.

The first source is the 1977 National Survey on Drug Abuse, commissioned by the National Institute on Drug Abuse (Abelson et al. 1977), and carried out jointly by the Social Research Group of George Washington University and the Response Analysis Corporation (Cisin et al. 1978). The sample consisted of 4,594 respondents, aged 12 years and over, randomly selected from the household population of the contiguous United States. Although interviewing was person-to-person, all data concerning drug use were filled in by the respondent, put in a sealed envelope, and mailed separately. Fieldwork was conducted during the spring of 1977.

The study is the fourth such survey conducted since 1972. Thus a large amount of trend material is available. Continuing study of data from these surveys indicates that nonmedical drug use is highly correlated with age. Thus results will usually be presented in terms of three age groups: youth (12 through 17), young adults (18 through 25); older adults (26 and over).

The second study is that of a large sample of high school seniors (17,087 in 1977), drawn from 124 schools, public and private (Johnson et al. 1977). Three-year-trend comparisons are available. The survey was conducted by the Institute for Social Research, University of Michigan, under NIDA sponsorship.

The third study focused on a group where drug abuse is particulary common—young men aged 20 to 30 (O'Donnell et al. 1976). A national sample of 2,510 young males was interviewed. The study was conducted in 1974-75 by the University of Kentucky and the University of California, Berkeley, with fieldwork done by the Institute for Survey Research, Temple University. NIDA was the sponsor.

There generally is little value in direct comparison of all results from the three surveys. Questionnaires differed as did modes of administration; the survey of young males was conducted 2 years before the other two surveys, and, as we shall see, there were significant changes over the 2 years; age groups are not strictly comparable. Therefore, we shall discuss the three surveys separately.

THE NATIONAL SURVEY ON DRUG ABUSE

"Panorama" of Drug Use, by Age Groups

A glance at the "panorama" of drug use (table 1) indicates that drug abuse is most commonly found among young adults, aged 18 to 25. Among this group, sometime use of marihuana[1] can be considered statistically normal, with as many as 1 in 4 classifying themselves as "current" users (i.e., used in the month preceding the survey). One-fifth have tried hallucinogens or cocaine and about one-tenth have used opiates other than heroin. If all nonmedical drugs "stronger" than marihuana are considered together, we can see that about one-third of the young adults have had some experience with one or more of them. This is also the group where licit drugs (alcohol and cigarettes) are most commonly used.

In sharp contrast, the older adults report limited experience with nonmedical drug use. Fifteen percent have used marihuana and 3 percent are current users,

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[1] Includes hashish.

TABLE 1.—*Lifetime prevalence and recency of use, by age, in percent*

	Youth (Age 12 to 17)		Young Adults (Age 18 to 25)		Older Adults (Age 26+)	
	Ever Used	Used past month	Ever Used	Used past month	Ever Used	Used past month
Marihuana and/or hashish	28	16	60	28	15	3
Inhalants	9	1	11	([1])	2	([1])
Hallucinogens	5	2	20	2	3	([1])
Cocaine	4	1	19	4	3	([1])
Heroin	1	([1])	4	([1])	1	([1])
Other opiates[2]	6	1	13	1	3	([1])
Stimulants (Rx)[3]	5	1	21	2	5	1
Sedatives (Rx)[3]	3	1	18	3	3	([1])
Tranquilizers (Rx)[3]	4	1	13	2	3	([1])
Any illicit drug "stronger" than marihuana[4]	(9)	NA	(34)	NA	(12)	NA
Alcohol	53	31	84	70	78	55
Cigarettes	47	22	68	47	67	39
Number of persons	1,272	1,272	1,500	1,500	1,822	1,822

[1] Less than 0.5 percent.

[2] Includes methadone.

[3] Nonmedical use. Estimates based on split sample: N=623,750 and 897, respectively.

[4] "Stronger" drugs defined as: hallucinogens, cocaine, heroin, and other opiates.

NA: Not available.

but lifetime experience with "stronger" drugs is very infrequent and current use is minuscule. Only in the use of the older, licit drugs, alcohol and tobacco, do the older adults report fairly high proportions of users.

The youth group's drug behavior is somewhere between the two adult groups. However, as subsequent data will suggest, drug experience within the age 12 to 17 group increases sharply as the upper limits are reached and approaches that of the young adults.

Trends in Drug Use

With the single exception of cocaine, which received widespread media coverage, percentages of use of the stronger drugs have remained stable between 1976 and 1977. In the case of marihuana, there has been a significant increase among youth and adults. Over a 5-year period the rise has been even more substantial. For example, the 14 percent of the youth group who in 1972 had tried marihuana had doubled by 1977; the 7 percent of the youth group who were "current" users in 1972 also had doubled.

Other data from the survey show how a single drug can suddenly become popular. In earlier years of the national survey, the hallucinogen PCP was so infrequently used that it was not studied separately until 1976. A comparison of the 2 years indicates that experience with this drug increased significantly among youth and young adults in the course of a year (table 2).

TABLE 2.—*Lifetime prevalence of PCP, 1976-77: youth, young adults, and older adults*

	Ever used		Changed
	1976	1977	1976-77
Youth	3	6	SS
Young adults	9	14	SS
Older adults	1	1	NS

SS: Significant at 0.01 level.
NS: Not significant.

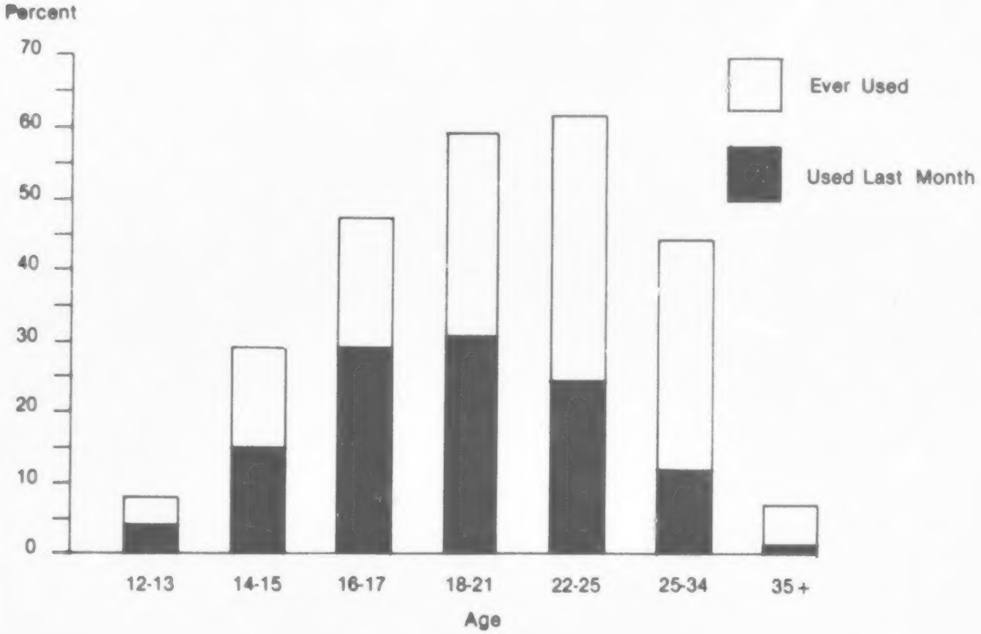
Nevertheless, the largest increase in prevalence took place in respect to a single drug, marihuana. Drug behavior in respect to stronger drugs, though on a much lower level, appears to parallel the pattern of marihuana use. Thus, in our discussion of the national survey findings, we will tend to concentrate on marihuana, occasionally citing comparisons with a combination of stronger drugs.

Marihuana and Age

The current pattern of marihuana use is associated closely with age, and figure 1, below, shows how this phenomenon is accentuated as age groups are refined. Marihuana experience seems to "take off" after age 13 until it peaks at ages 22 to 25, drops sharply among the 26- to 34-year olds, and almost disappears among those aged 35 and older. A similar pattern can be seen in respect to "current use" of marihuana, though in this case the peaking and decline both appear to operate a few years earlier.

Do such figures mean that we can count upon future populations simply "maturing out" of nonmedical drug use? Prediction is always hazardous. The 1975 study of young men reports lower rates of drug use among those who are married (O'Donnell et al.) and secondary analysis from the 1974 national survey finds the same pattern for young men and women

FIGURE 1.—*Lifetime prevalence and recency of use of marihuana, by age groups*



alike (Cisin and Miller 1976). Such licit drug abuse as the use of alcohol as a coping mechanism for psychic distress also is less common in stable households (Parry et al. 1974, Parry and Cisin, in press). Such evidence argues in favor of the "maturation" theory.

Marihuana "Entries" and "Exits"

One way to look at marihuana use is in terms of "entries" and "exits" based on the current year of the survey. During this period, for each age group, a certain proportion tried marihuana for the first time, another proportion which had used marihuana at least once in the preceding year reported no use of marihuana in the last 12 months. Finally, along with these "entry" and "exit" groups there stands the "continuing use" group—those persons who had used marihuana in the preceding year and were still using it in the year of the survey. Similar calculations can be made for the stronger drugs.

Several patterns can be noted in this analysis (table 3). First of all, in 1977, half of the 12- and 13-year-olds who had ever used marihuana seem to have used it first at an even earlier age and were continuing to use the drug. We also can note that "entries" are concentrated between ages 14 and 17 and slightly overbalance "exits." From then on, relatively few persons seem to start marihuana use, while the proportion of "exits" jumps sharply. By the time the age 26 to 34 group is reached, the "exits" balance the "entries" and the "continuing users." Analyses mentioned earlier indicate that young adults tend to discontinue drug use as they marry and have children. There also is evidence that persons who used marihuana while at college often "exited" when they left school, took a job, and found themselves in contact with a different peer group. These data support the concept of maturation out of the youth culture and the assumption of adult roles (Miller et al. 1978). The pattern for drugs stronger than marihuana was remarkably similar, but in this case "exits" predominated several years earlier.

At the same time, special analysis with selected birth cohorts (Miller et al. 1978) presents evidence suggesting that the era into which one is born (rather than chronological age) is more important (figure 2). Such data weaken to an unknown degree the automatic maturation theory.

The Factor of the Social Climate: Acquaintance and Opportunity

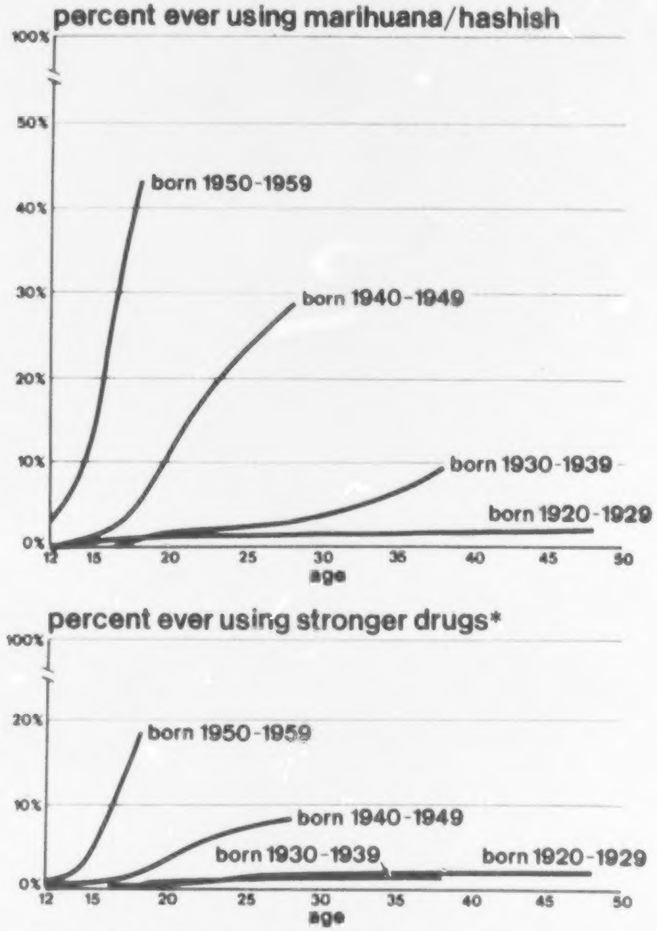
This cohort interpretation is supported by data dealing with the social climate. "The social climate of a particular behavior is in large part defined by the degree to which that behavior is considered known and familiar on a society wide basis, i.e., the extent to which that behavior has been incorporated into the context of everyday life" (Miller et al. 1978).

Fifteen years ago, for example, few persons of any age personally knew marihuana users; still fewer were acquainted with users of stronger drugs. By 1977, nearly all young adults personally knew marihuana

TABLE 3.—*Percent of new users, continuing users, and former users of marihuana*

	Age						
	12-13	14-15	16-17	18-21	22-25	26-34	34 and over
Entries							
First use in current year	3	9	9	4	2	1	1
Continuing users							
First use before current year, still using	6	22	37	41	36	21	2
Exits							
First use before current year, no use in current year	3	6	10	17	26	23	5
Number of persons	394	432	446	732	768	668	1,153

FIGURE 2.–*Lifetime experience with marihuana/hashish and stronger drugs* for selected birth cohorts***
From *Highlights from the National Survey on Drug Abuse: 1977*



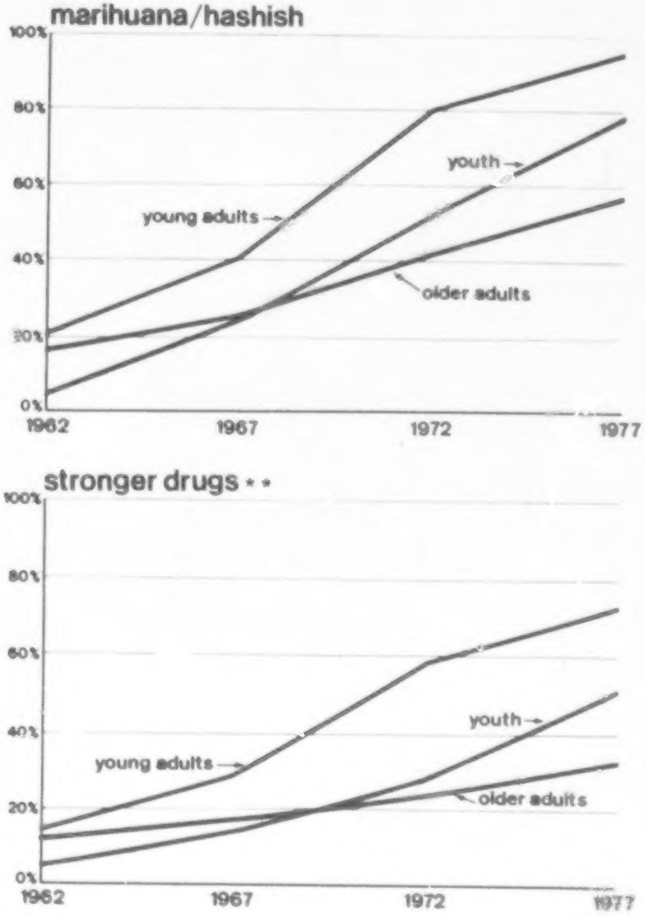
* Includes cocaine, hallucinogens, heroin, and other opiates   * * Based on reconstructed data

users and most of them also knew users of stronger drugs (figure 3). Similar patterns of change can be noted among youth and even among older adults. Along with acquaintance went opportunity. In 1962, few respondents ever had the opportunity to use (i.e., were offered) marihuana; still fewer had the opportunity to use stronger drugs. By 1977, over 80 percent of the young adults reported having a chance to use marihuana and over half reported having the chance to use something stronger (figure 4). Similar trends can be noted among the two other age groups. Thus the effect of the current social climate is to make marihuana use seem commonplace and to increase the opportunity to experiment; and this to a lesser extent also applies to the stronger drugs.

Marihuana and the Law

The split between young and older adults in marihuana use also was reflected in attitudes toward the control of marihuana (table 4). Respondents were asked to respond to five "scenarios" ranging from unrestricted sale of marihuana as a commercial product to stricter laws, law enforcement, and penalties against marihuana use.

FIGURE 3.—*Trends* in acquaintance with users of marihuana/hashish and stronger drugs***
From *Highlights from the National Survey on Drug Abuse: 1977*

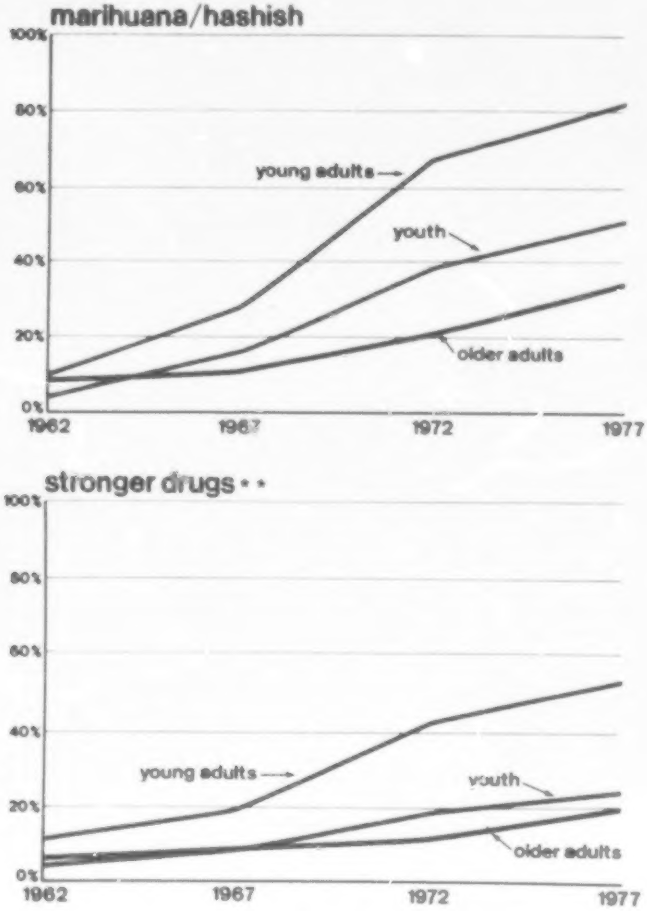


marihuana/hashish

stronger drugs **

* Based on reconstructed data
** Includes cocaine, hallucinogens, heroin, and other opiates

FIGURE 4.–*Trends* in the opportunity to use marihuana/hashish and stronger drugs***
From *Highlights from the National Survey on Drug Abuse: 1977*



* Based on reconstructed data
** Includes cocaine, hallucinogens, heroin, and other opiates

TABLE 4.–*Acceptable marihuana future, youth, young adults, and older adults, 1977, in percent*

	Age		
	12 to 17	18 to 25	26 and over
Regular commercial product	21	27	9
Closely regulated product	40	57	31
Possession for personal use legal, but not sale	39	53	28
Having, using, or selling illegal	62	40	62
Laws made stricter than now	59	36	65

It can be seen that a majority of young adults currently favor decriminalization of marihuana use, or even allowing it to be sold under regulation in licensed stores. In contrast, nearly two-thirds of the older adults support the status quo, or even stricter laws against marihuana.

But this is not the whole story. Since 1971, when the question was first asked, there has been a significant shift in opinion within both age groups. At the time of the first survey, young adults split rather evenly between decriminalization and stricter enforcement, while as many as three-fourths of the older group favored stricter laws. Thus both groups have shifted toward leniency which now is supported by a majority of the young adults and nearly one-third of the older adults.

Trends do not necessarily continue, but the data suggest a slow but continuing shift toward leniency. Whether the trend continues depends to a degree upon the youth group of respondents (ages 12 to 17) who will be moving into the young adult world and exercising the franchise in a few years. At present, the attitude of this group resembles that of the older adults rather than the young adults—a majority favors stricter laws against marihuana. However, data cited earlier on marihuana use suggest that their opinion will switch toward leniency in the next few years.

THE SURVEY OF HIGH SCHOOL SENIORS

The drug behavior of 1977 high school seniors is remarkably like that of the young adults (ages 18 to 25) in the 1977 National Survey (table 5). To facilitate the comparison, data from table 1 have been listed along with the data from the high school study (Johnson et al. 1977).

Well over half of both groups have used marihuana, but the seniors are more likely to have used it in the past month. Inhalant percentages are almost identical. When it comes to hallucinogens, cocaine, heroin, and miscellaneous opiates, the young adults report somewhat higher lifetime use, but the seniors are slightly more likely to be current users. When lifetime use of the stronger drugs is cumulated, however, the two groups show almost identical patterns.

When it comes to experimentation with the contents of the medicine cabinet, however, the high school seniors report higher lifetime use in the case of tranquilizers and higher percentages of current use for all three of the psychotherapeutic drug classes.

Turning to the licit drugs, we can note that experience with alcohol and cigarettes is more common among the seniors than the young adults, but the second group is more likely to have smoked recently.

The data here strongly suggest that patterns of drug use extending into young adulthood have already been established by the end of high school and in many instances earlier.

First Use of Various Drugs

The preceding table suggests very strongly that patterns of drug use have been established by the senior year in high school. Additional analysis indicates that in many instances the behavior goes back to junior high school or earlier (table 6).

In the case of licit drugs (alcohol and cigarettes), large majorities of lifetime users had their first experiences before high school. Similarly, about half of those who had ever used marihuana began before entering. The same finding applies to about one-fouth of the users of prescription psychotherapeutic drugs and even of cocaine.

Thus, to an appreciable degree, drug behavior appears to be established before high school.

TABLE 5.—*Prevalence (percent ever used) and recency of use of 11 types of drugs, class of 1977*
(N=17,116)

	High school seniors		Comparable percentages from young adults in national study (N=1,272)	
	Ever used	Past month	Ever used	Past month
Marihuana	56	35	60	28
Inhalants	11	1	11	([1])
Hallucinogens	14	4	20	2
Cocaine	11	3	19	4
Heroin	2	([1])	4	([1])
Other opiates[2]	10	3	13	1
Any drug "stronger" than marihuana[3]	36	NA	34	NA
Stimulants[2]	23	9	21	2
Sedatives[2]	17	5	18	3
Tranquilizers[2]	18	5	13	2
Alcohol	92	71	84	70
Cigarettes	76	38	68	47

[1] Less than 0.5 percent.
[2] Only drug use which was not under a doctor's orders is included here.
[3] "Stronger" drugs, defined as hallucinogens, cocaine, heroin, and other opiates.
NA: Not available.

TABLE 6.—*Percent of first use of selected drugs by high school seniors*

Drug	Junior high school or earlier	10th grade	11th grade	12th grade
Marihuana	26	12	11	6
Hallucinogens	4	3	2	1
Cocaine	2	2	3	2
Stimulants	5	5	4	2
Sedatives	4	4	3	1
Tranquilizers	4	3	3	2
Alcohol	53	18	14	7
Cigarettes	19	6	4	2

385

Trends in Drug Use Among High School Seniors

In the period of time covering the three high school surveys, the main trends have been a substantial rise in the lifetime use of marihuana and to a lesser extent of the "trendy" drug cocaine. A similar upward trend can be noted in the percentages of high school seniors who used marihuana during the year of the survey (table 7). The use of hallucinogens, whether lifetime or in the past year, showed a slight decline. Use of other drugs was relatively stable. Clearly, the largest increases are concentrated in marihuana use.

This increased prevalence was not distributed evenly among high school seniors. It was disproportionately concentrated among females, students planning to complete 4 years of college, and students in the South, and this pattern applied both in terms of lifetime prevalence and past-year prevalence.

Not only did marihuana use by high school seniors increase in simple percentages, but frequency of use by users increased. By the time of the 1977 study, about 1 in 4 of the high school seniors reported having used marihuana 40 or more times; nearly one-tenth reported daily use in the last 30 days. It seems clear that the increase is both extensive and intensive.

Intensive use of marihuana, however, was not sanctioned by the great majority of high school seniors: regular use of the drug by persons "who are 18 and older" was condemned by two-thirds of the sample.

Regulation of Marihuana

We have noted earlier that in the national survey, young adults (ages 18 to 25) favored decriminalization of marihuana, while older adults opposed it. The youth group (ages 12 to 17) was closer to the older adults than the young adults.

In the high school senior study, we are dealing with a group primarily composed of the top of the youth age group and the bottom of the young adults (ages 17 and 18, respectively). Thus the high school seniors provide a linkage, in terms of age, between the two, and their opinions give some evidence of what the opinions of the youth group may be in a few years.

TABLE 7.—*Trends in lifetime and past-year prevalence of selected types of drugs, 1975-77*

Drug	Percent ever used			Percent used past year		
	1975	1976	1977	1975	1976	1977
Marihuana	47	53	56	40	44	48
Cocaine	9	10	11	6	6	7
Hallucinogens	16	15	14	11	9	9

The questions are different, but similar enough so that cautious comparison can be made. The results of such a comparison suggest that by the last year in high school seniors have swung over to decriminalization. Among the youth group in the national survey only 39 percent favored decriminalization of marihuana use; among the high school seniors only 27 percent believed that people 18 years or older should be prohibited from smoking marihuana in private, with the overwhelming majority opposed to such prohibition.

Such findings suggest an existing and probably continuing public opinion trend in favor of decriminalization of marihuana, either tacitly or expressly.

THE NATIONAL SURVEY OF YOUNG MALES

An earlier study of drinking patterns by Cahalan and Room (1972) concentrated on men aged 21 to 59, on the logical ground that this was where the action was. The national survey of young males, by the same logic, focused its attention on males aged 20 to 30.

Lifetime Prevalence and Current Use of Selected Drugs

The patterns of drug use among the young males in 1974 are remarkably similar to those of male high school seniors from the class of 1975 in the first of the three high school surveys. What differences there are probably stem from a combination of age and a year's difference in interviewing date. More than half of the young males had used marihuana, one-fourth during the past month (table 8). Less than half of the high school male seniors of the class of 1975 had tried marihuana, but about one-third were currently using it. In respect to hallucinogens, the pattern is similar: higher lifetime prevalence among the young males; higher current use among the male high school

TABLE 8.—*Lifetime prevalence and current use of selected drugs, in percent*

	Men aged 20 to 30		1975 High school male seniors	
	Lifetime use	Current use	Lifetime use	current use
Marihuana	55	26	46	32
Hallucinogens	22	2	18	6
Cocaine	14	2	11	3
Heroin	6	1	3	([1])
Other opiates	31	2	10	2
Stimulants	27	5	20	8
Sedatives	20	3	18	6
Alcohol	97	85	([2])	75
Cigarettes	88	55	NA	37
	N=2,510		N=8,110	

[1] Less than 0.5 percent.

[2] Not asked.

NA: Not available.

seniors. The same pattern can be seen for nonmedical use of stimulants and sedatives. However, when it comes to the stronger drugs—cocaine, heroin, and other opiates—lifetime prevalence among the young males is notably higher. They also are more likely to be current drinkers and smokers.

Total Drug Use Index

The authors of the study of young males were able to construct what they refer to as a Total Drug Index, following the lead of K. H. Lu (1974), and to assign each respondent a score based on his pattern of drug use.

Certain demographic, behavioral, and ideological factors seems to be associated with significantly higher scores on this index.

1. Age: Drug use index scores are lowest among those aged 30 at the time of the survey and tend to increase as age decreases. The highest scores were found among men aged about 20 through 23 years.

2. Education: Highest scores were found among those with less than high school or with some college but not a degree. In contrast, those who succeeded in graduating either from high school or college had significantly lower scores.

3. Employment: Those with steady jobs were lowest; part-time workers or the unemployed were highest.

4. Marital status: Those living in a familial situation—either with parents or with a wife—were lowest; those living on their own were somewhat higher; and, finally, those cohabiting with a woman were highest of all.

These findings support earlier discussions of the relationships between job and family stability; i.e., maturation, and lowered use of drugs.

5. Criminal activities: Those who admitted criminal activities, whether drug related or not, ranging from public drunkenness to armed robbery, consistently had higher drug-index scores than those who did not report such behavior. A similar relationship was noted in the cases of those who reported having bad companions at age 16 as distinct from those who had no such associations.

6. Countercultural involvement: Such involvement appeared to be just as highly correlated with high scores on the index as ordinary criminal behavior discussed above. Whether it be living in a commune, following a fad diet, being "into" an Eastern religion or philosophy—those who reported such behavior invariably scored higher on the Total Drug Use Index.

7. Acceptance of unconventional behavior: Not only is actual unconventional behavior associated with higher scores, but even verbal acceptance of such behavior. But here the pattern is not simply countercultural. Respondents who thought it "all right" to indulge in speeding, cheating on income tax, and such macho behavior as brawling, ranked higher on the index than those who condemned such behavior. But, also, so did respondents who supported draft resistance.

Thus when it comes to total drug-use scores, which include both traditional drugs (alcohol) and counterculture drugs, all kinds of behavior and attitudes which diverge from the norm—whether the divergence be criminality, machismo, or countercultural activity and beliefs—seem to be associated with higher levels of drug use, though the drugs may differ.

Advantages and Disadvantages of Drug Use

Users of various drugs often reported bad effects from the drug. For alcohol, most often it was blackouts and fights; for hallucinogens, bad trips and being high for more than a day; being high more than a day also was mentioned in respect to stimulants; dependence in the case of heroin.

When they were asked whether the total effect on their lives of the use of various drugs was good or bad, the answer was primarily negative. There was a single exception—more marihuana users reported good than bad effects (table 9).

SUMMARY AND CONCLUSIONS

This chapter discusses and analyzes certain data on drug use based on three sample surveys:

1. The 1977 National Survey on Drug Use, with trends dating back to 1972.

2. The 1977 study of high school seniors, with trends back to 1975.

3. The 1974-75 study of drug use among young males, aged 20 to 30.

TABLE 9.—*Percent of users who perceived benefits from drug use and their perception of the overall effect drug usage has had on their lives*

		Overall life effect		
	N	Very bad or bad	None	Very good or good
Tobacco	(2,211)	66	22	12
Alcohol	(2,434)	46	21	33
Marihuana	(1,382)	33	22	45
Psychedelics	(550)	54	12	35
Stimulants	(581)[1]	48	13	39
Sedatives	(409)[1]	58	11	31
Heroin	(148)	74	13	14
Opiates	(493)[1]	51	17	33
Cocaine	(352)	43	18	39

[1] Nonmedical use only.

Since the three surveys used different sampling universes and since the last survey was conducted nearly 3 years earlier, comparisons can be made only with caution. Nevertheless, certain conclusions can be drawn that are supported by evidence from more than one source.

Among respondents in their late teens ranging well into their twenties, acquaintance with marihuana is now statistically normal behavior. Half or more of young adults (ages 18 to 25), high school seniors, and young males have had lifetime experience with marihuana and one-fourth to one-third had used it in the month preceding the survey. Among the young adults and high school seniors, one-third reported experience with a drug stronger than marihuana, and at least as many among the young males aged 20 to 30.

Only in the cases of marihuana and to a very small degree the "trendy" drug cocaine has there been a significant increase in lifetime prevalence in the past year in use of the various drug classes. However, there has been a significant increase in lifetime prevalence in the case of a single drug—PCP ("angel dust")—among the young adults and also among those aged 12 to 17. At present, among experimenters, PCP has the chance of becoming a fad.

The illicit drug of most common use, whether in terms of lifetime prevalence or current use, is marihuana. Currently, the major factor associated with marihuana is age (or birth cohort). Marihuana use appears to "take off" after age 13 until it peaks at ages 22 to 25, drops off sharply among the age 26 to 34 groups, and almost disappears among those aged 35 or older.

Evidence from all three studies suggests that much of this drop in marihuana use can be attributed to the concept of "maturing out" of nonmedical drug use and the youth culture and the assumption of adult roles, as well as contact with a different peer group. In both the national study and the study of young males, graduation from college, holding a full-time job, and marriage (particularly if there were children) were all associated with lowered level of marihuana and stronger drug use. Data based on marihuana "entries" and "exits" suggest that this process begins sometime around age 25.

But this automatic maturation theory is not the only piece of evidence to be considered. Certain data from the national survey suggest that it is not the chronological age of the respondent that counts as much as the era in which he was born and the milieu in which he lives. Thus, persons born in the decade 1920-29 hardly ever have had experience with marihuana or stronger drugs. Persons born later have used both to a greater degree. Since 1962 there has been a notable increase in the proportion of persons having acquaintance with users of both sorts of drugs and personally having the opportunity to use them. Thus the social climate works in favor of marihuana use continuing to an increased age in the future.

Older adults oppose decriminalization of marihuana, and two-thirds of them would like to see the current laws made more stringent. In contrast, young adults (ages 18 to 25) support decriminalization. Youth (ages 12 to 17) expresses an opinion closer to the older adults. However, a comparison with the views of the 1977 high school seniors, mainly consisting of the top of the youth group and the bottom of the young adult group (ages 17 and 18, respectively), suggests that the young respondents will have moved toward favoring decriminalization as they move out of the teens in the next few years.

Drug use among the 1977 high school seniors is very similar to the patterns found among young adults in the national survey, suggesting that the patterns of use extending into the twenties have already been established by the last year in high school. Indeed, in a very large number of cases, the patterns have already been established in junior high school: 26 percent of the seniors had used marihuana at this early period; more than half had used alcohol; 1 in 5, cigarettes.

Young males, aged 20 to 30, surveyed in 1974-75, were compared to high school male seniors of the class of 1975. Patterns of drug use among both groups were remarkably similar, except in the case of cocaine, heroin, and other opiates, where the young males reported significantly higher lifetime prevalence rates.

In this survey, analysis by the use of the Total Drug Use Index suggested that high scores on the index are associated with lower age; failure to complete a started education, whether high school or college; lack of a stable marital situation; criminal activities; countercultural involvement; and acceptance of unconventional behavior. All of these are departures from social norms in one direction or the other.

FUTURE RESEARCH

In light of the current findings, certain areas of research can be recommended for the future:

1. Continuing trend studies of the spectrum of drug use, both in terms of lifetime incidence and of current use.

2. More intensive research in respect to the age of first introduction to drug use, with emphasis on junior high school.

3. Continuing studies on the "social climate" of drug use.

4. Continuing studies touching the concept of "maturing out" of nonmedical drug use versus cohort analysis. At present, respondents start dropping out in the late twenties. Will this trend continue over the next decade or will the age of dropping out advance indefinitely?

5. In the past, drug use has been associated with deviance of various kinds. Currently, some experience with marihuana is now majority behavior among young adults. If this trend continues, will the use of marihuana come to be associated with conformity and "normal" behavior?

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37. Incidence and Prevalence of Drug Use and Abuse

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INTRODUCTION

Incidence and prevalence are concepts borrowed from medical epidemiology where they were first used to describe the rates of occurrence and the total extent of cases of infectious diseases. They are only roughly applicable to drug use, which may be either a chronic or an episodic condition, and they are barely suitable when used to characterize drug "abuse," which is invariably an arbitrary term lacking sufficiently precise definition to be measured accurately. Nevertheless the concepts are useful since they are the only way to discuss the extent and changes in extent of a drug's use in a given population.

The difficulties in applying the ideas of incidence and prevalence to drug use are clear from the equation which connects them:

$$P_n = P_{n-1} + I_n - W_n + R_n \qquad \text{(1), where}$$

P_n = the number of users that have been active at any time in period n.

I_n = number of new users beginning at any time during period n.

W_n = number of users counted as active during period n-1, who did not use at any time during period n. Note that this means they must have stopped use in period n-1, not during period n, because then they would have been active users during period n.

R_n = number of users who had been active at some past time, but not during period n-1, and who resume use during period n.

Equation (1) is only a shorthand way of saying that the number of active users during any period is equal to the sum of old users continuing from the preceding period plus new cases beginning during the period minus those who stop use plus former users who resume use.

This equation has no practical value because it cannot be used to calculate prevalence. The terms I, W, and R are themselves unknown and undoubtedly complex functions of demography and drug availability, etc., and they usually cannot be measured at all. The equation does illustrate the problems in understanding what is meant by extent, and changes in extent, of drug use. For instance, we define P_n as the number of active users during the nth period. What do we mean by "active"? To satisfy the equation, active users must be limited to those using only within the nth period, however it be defined, otherwise they contradict the conditions of W_n (those active during n-1 but not during n). Similarly if I_n are those cases of new use during n, they must also represent first use, since otherwise they are subsumed under R_n.

Though these definitions are consistent, they are by no means universally used, or even widely understood. Typically "prevalence" may include any cases of active use within an arbitrary past period, even "lifetime prevalence"—those who have ever used the drug. "Incidence" is equally imprecisely used as not only first use but also to include current episodes, in the sense of "incidents of drug taking" within some fixed period. These loose usages blur whatever precision the terms may originally have had (and can, in fact, make incidence and prevalence mean the same thing).

FIGURE 1.—*An incidence of first-use curve showing rapid growth of use. (From Hunt 1974b.)*

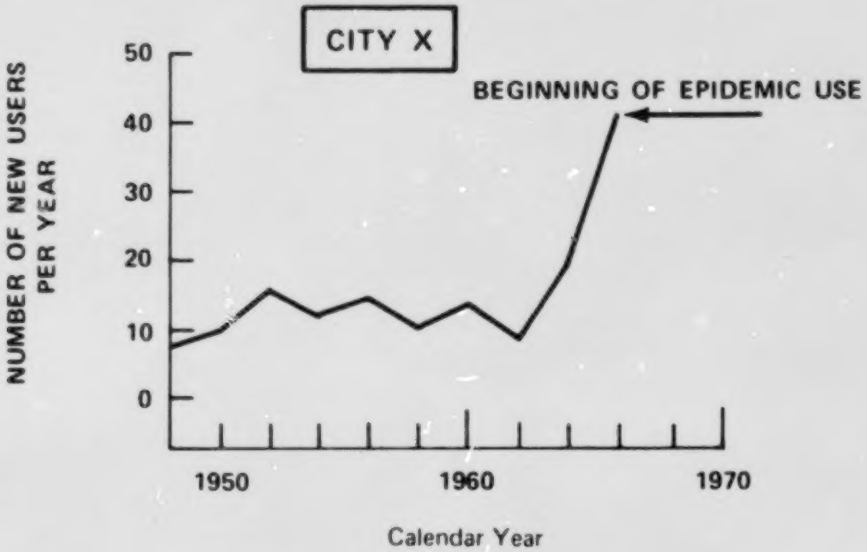
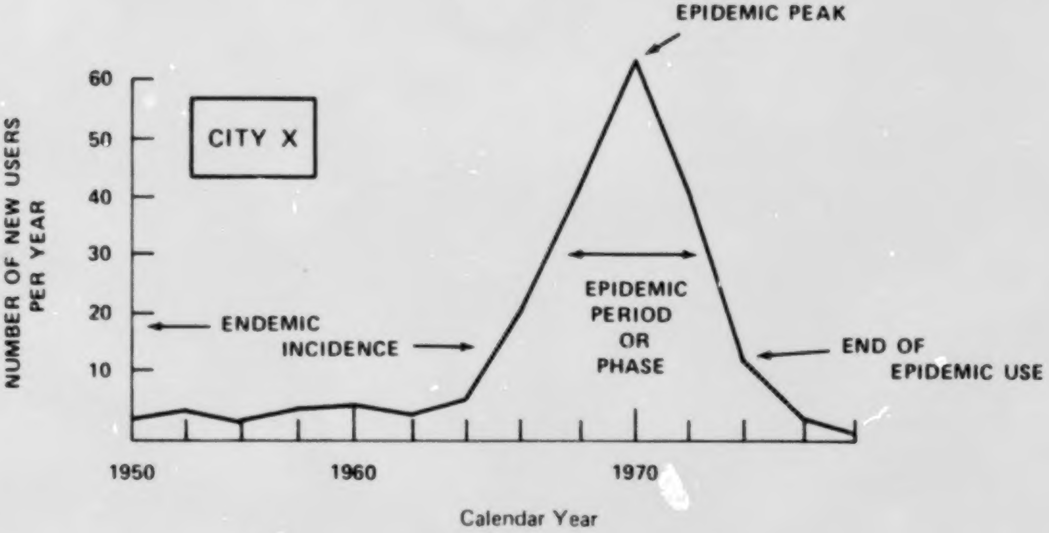


FIGURE 2.—*An incidence of first-use curve showing rapid growth and then decline in new use. These peaks are sometimes called "epidemics" of drug use. (From Hunt 1974b.)*



392

Here we shall confine our use of prevalence and incidence to definitions required by equation (1). Prevalence means the number or population rate of cases of active use during the period n (whatever its duration) and incidence means first use during that interval. We shall not discuss W and R at all, since there are no estimates of these quantities, and their behavior for drug-using populations is poorly understood.

INCIDENCE ANALYSIS

The principal reason for studying incidence of first use is to learn whether a drug is spreading (Hunt 1974 a,b). If the number (or population rate) of new cases occurring in the most recent period is greater than those in preceding intervals, then use of the drug is spreading (figure 1). If less, then new use may be dying out (figure 2), though total active cases may be unchanged or even higher than before, depending on the behavior of W and R in equation (1).

More precisely, if new users represent the same populations (in terms of race, sex, and locales) as earlier ones, then the drug's locus of use is stable, though users may be increasing. In this situation, use would be increasing in the same group it started in. If, however, new users include race/sex and geographic groups who were not formerly known to be users, then the drug may be migrating to new populations, as well as spreading within its original group (figure 3).

These considerations are elementary but useful to planners who must locate and staff treatment programs. Experience has shown that treatment facilities must be near the population of users they are intended to serve and should be staffed by workers congenial to the users (for instance, male Chicano heroin addicts resent female counselors). These basic results of incidence analysis also raise more difficult questions. If incidence of new use were determinable by longitudinal probability samples from the general population, its interpretation would be straightforward, but it seldom is. Typically we must rely on small unrepresentative samples, such as treated populations, for which there is access to detailed onset of use data. These special samples raise two problems: (1) What is their relevance to new use in the general population, and (2) what are their structural peculiarities which influence interpretations of changes in new use?

The first question is really unanswerable, since we do not know how incidence of new use behaves in the general population, but only that it is apt to be quite different in collocated subpopulations (Hunt 1977). However, where it is possible to match demographically similar samples from the same city, which are obtained from quite different sources, incidence is usually similar (figure 4) (Hunt and Chambers 1976; Hunt 1977). We are therefore empirically justified in taking local data, say a group of treatment records, to be reasonably typical of their race/sex groups within their provenance.

The second question is more difficult. The special character of many incidence samples undoubtedly does bias their record of the growth of local drug use. For instance, the lag between first use of a drug and a user's subsequent entry into treatment means that treatment-derived incidence samples always understate current new use (figure 5) (Hunt 1974 a,b). Correction must be made for this lag before treatment data can provide a reasonable view of new use. Lag corrections are made by determining the distribution of waiting time to enter treatment for a given sample, then adjusting each year's onset cohort according to this distribution.

Another bias common in special incidence samples (such as treatment programs targeted to special groups) results from age clustering. Age at onset of use follows a definite and well-known distribution for each drug (Hunt 1977). If all users in a sample are within a year or two of the modal age of onset, then this sample will necessarily show a peak in new use in the preceding calendar year, independent of the actual historical growth of use in the parent population (Hunt 1977). For instance, most marihuana use begins around age 14. Therefore a sample of 15-year-olds would probably show a peak of new use during the preceding year. Such false peaks in incidence of first use that result from age biases are easy to detect and correct (figure 6), using age at onset distributions. More generally, the relationship between age and year of first use leads to a statistical test for epidemic growth in new use which is independent of the age structure of the sample (Hunt 1977).

To summarize, when properly interpreted, incidence of first use (along with age at onset data) can define the growth or decline of drug use in specific populations and may also demonstrate when a drug is shifting from one subpopulation to another.

FIGURE 3.–*Geographical location of new use of heroin in Omaha, Nebraska showing population shifts. In 1974 and later new use occurred in shaded areas. Dashed areas are principally white male cases; dotted are black male. (From Hunt and Chambers 1977.)*

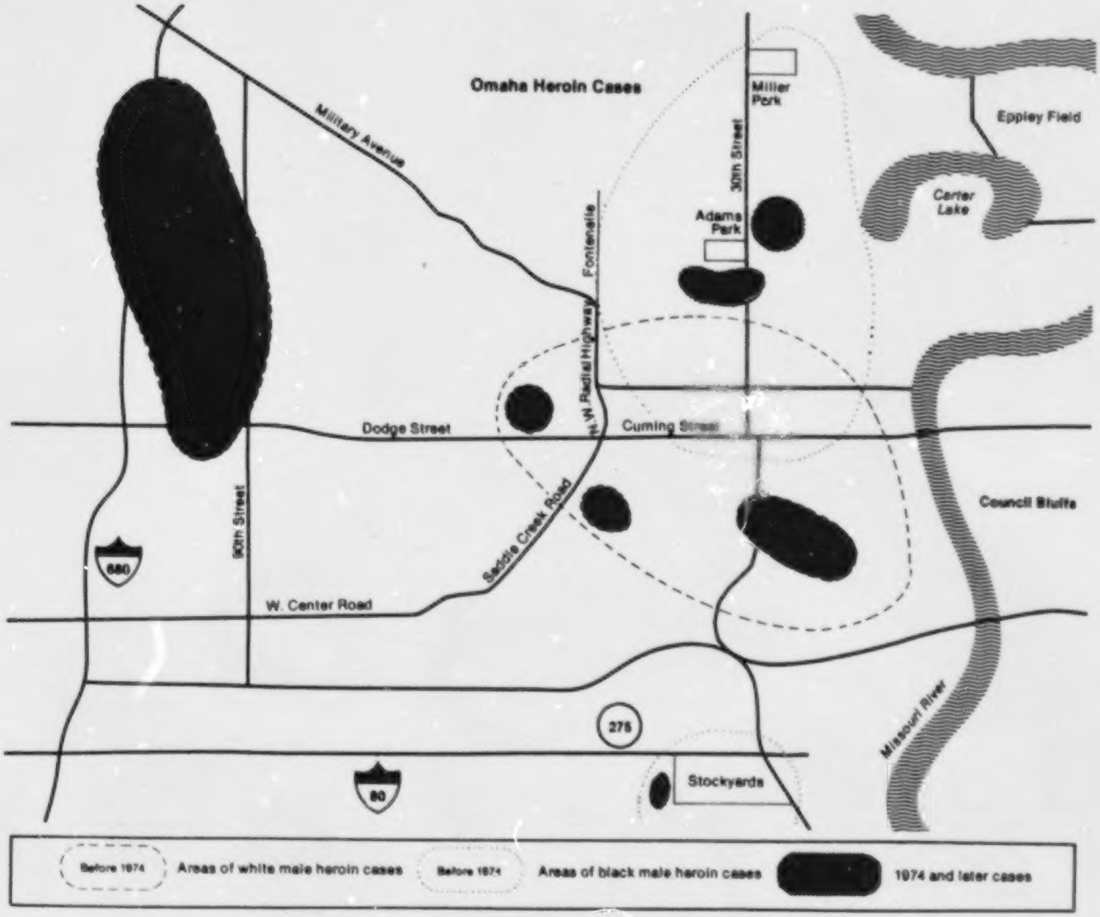
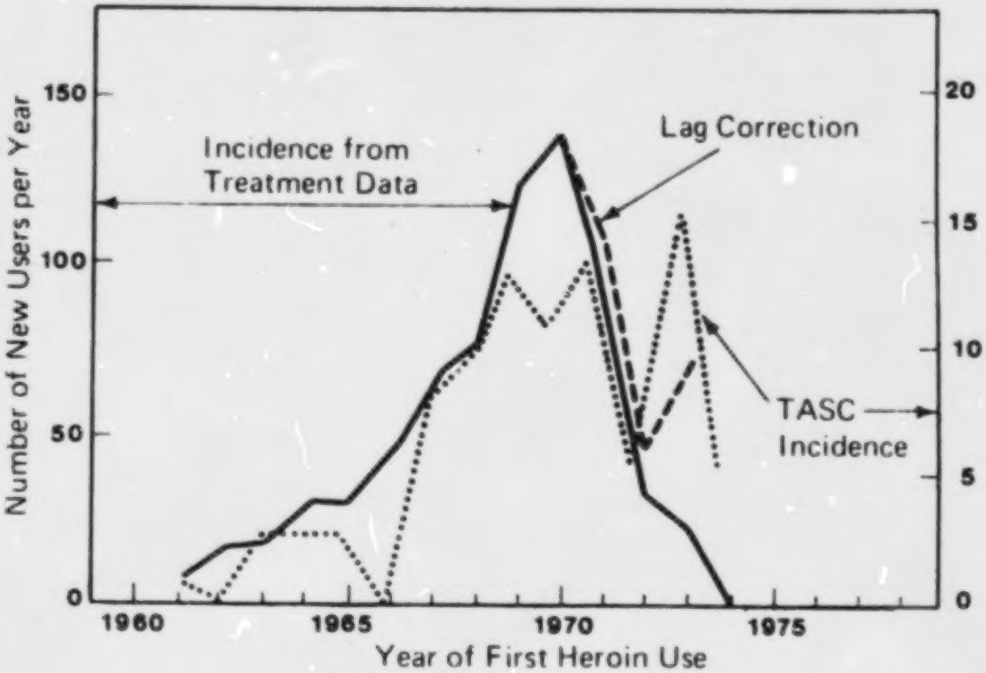

Omaha Heroin Cases
Military Avenue
Miller Park
30th Street
Eppley Field
Carter Lake
Adams Park
Fontenelle
N.W. Radial Highway
Dodge Street
Cuming Street
Council Bluffs
Saddle Creek Road
90th Street
680
W. Center Road
275
80
Stockyards
Missouri River
Before 1974
Areas of white male heroin cases
Before 1974
Areas of black male heroin cases
1974 and later cases

FIGURE 4.–*Incidence of first use of heroin in Austin, Texas, comparing treatment data with criminal justice (TASC) data. (Adapted from M. Greene, N. Kozel, L. Hunt, and R. Appletree, An Assessment of the Diffusion of Heroin Abuse to Medium-Sized American Cities, Washington, D.C., Government Printing Office [Executive Office of the President, Special Action Office for Drug Abuse Prevention Monograph A-5], October 1974; data through 1974.) (Figure from Hunt and Chambers 1977.)*



PREVALENCE ESTIMATES

There are two approaches to determining the number and characteristics of individuals misusing drugs. The first is to break down the parent population into subpopulations according to age, race, sex, and other sociodemographic characteristics, to sample each group (stratum), and to ask the sampled individuals about their drug use. This is the method of sample surveys. It has the advantage of yielding results that are easily generalized to the total population. It has disadvantages of three sorts

(1) It requires that any individual can be sampled, that his probability of selection be known, and, if sampled, that he respond truthfully.

(2) It assumes that the interviewer (or questionnaire designer) be able to frame questions which will define existing problems caused by drug misuse.

(3) For rare conditions (like serious drug abuse), it is imprecise, or requires very large samples.

The second approach is exactly opposite. It consists of finding groups of individuals in a community who are manifestly victims of drug misuse, determining their characteristics, and then using these characteristics, along with statistical relationships among the different groups, to obtain estimates of total drug victims. This method (recapture sampling) has the advantage of dealing with positively identified drug misusers, for whom there is no definitional ambiguity (Are they "really" drug abusers?). It has the disadvantage of requiring fairly complex mathematical techniques to obtain estimates of total populations.

FIGURE 5.—*Development of a hypothetical incidence curve as recorded by the intake of a treatment program. Solid line is cumulative incidence for the year indicated. (1) a is the incidence of new users from year (m-1) who had appeared by the end of year m. (2) more had appeared in year m+1. (3) c entered the program in year m+2, (4) the final stable form of the curve. (From Hunt 1974a.)*

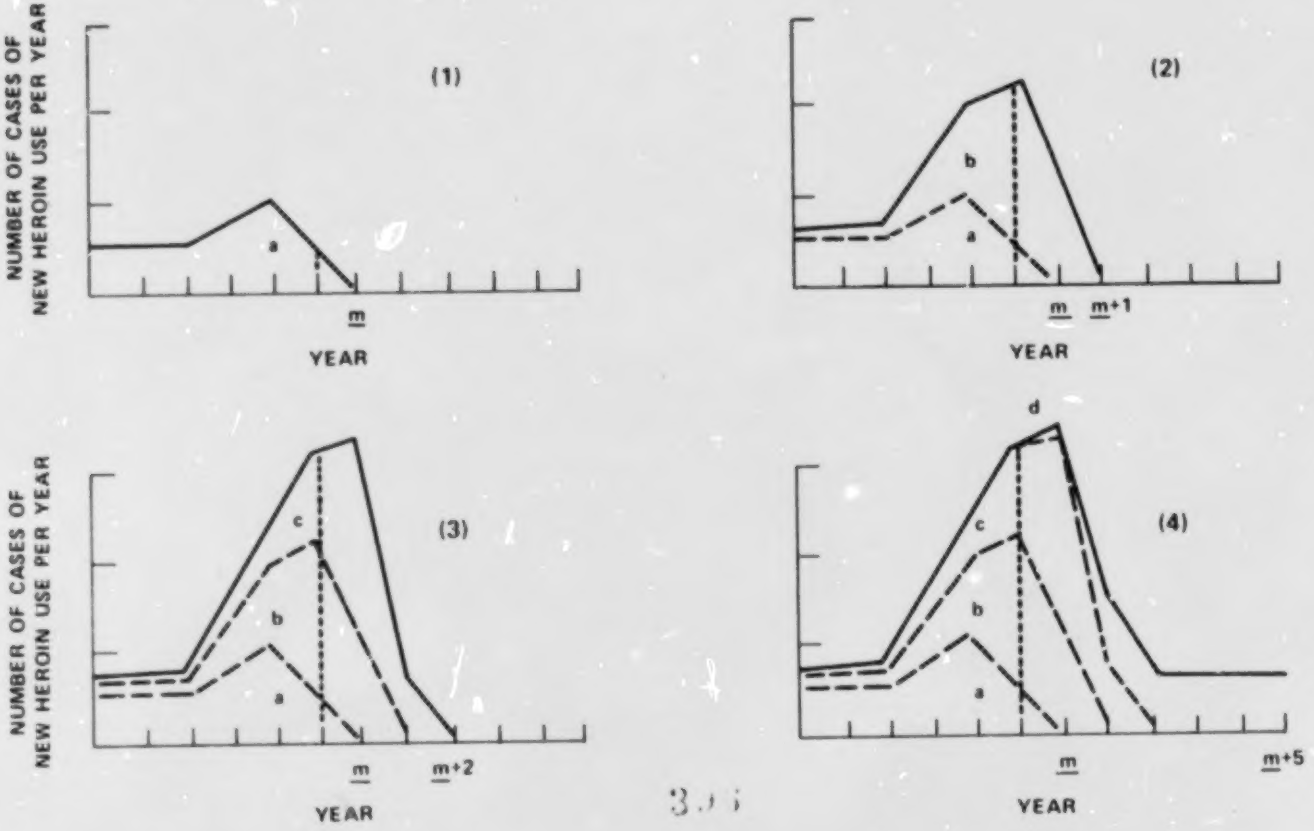
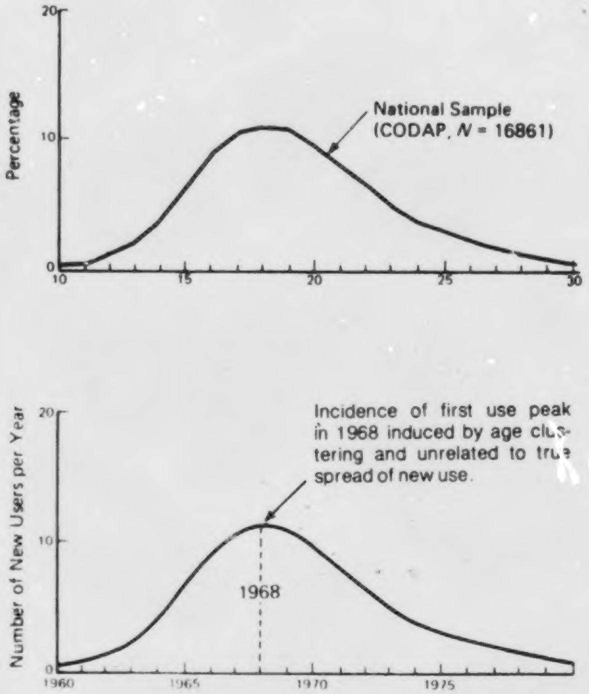


FIGURE 6.—*Top: Age at onset of heroin use in a national sample. Bottom: A hypothetical incidence of first-use curve based on a single (1950) birth cohort of 100 heroin users experiencing onset of use as predicted by national data above. (From Hunt and Chambers 1977.)*



These techniques are not difficult to apply (thanks to the development of versatile computer software), but they are slightly harder to understand than sample-survey theory.

The basic idea of recapture sampling is very old, dating at least from the 19th century when it was used to estimate the size of animal populations.[1] The primitive concept is simple: a sample of individuals ($\underline{s}_1$) is marked in some recognizable way and returned to the parent population ($\underline{N}$). A second sample ($\underline{s}_2$) is "recaptured" and the number of marked individuals ($\underline{m}$) from the first sample is noted.

The total population, $\underline{N}$, is therefore estimated by the relationship:

$$\frac{s_1}{\hat{N}} = \frac{m}{s_2} \text{ or } \hat{N} = \frac{s_1 s_2}{m}$$

($\underline{\hat{N}}$ is only an estimate because it is subject to sampling fluctuation.)

As applied to estimating drug misusers (alcoholics, rapists, illegal aliens, or any "hidden" group that is not readily identifiable), the technique uses publicly identified individuals as the marked and recaptured groups. For instance, a person might be "marked" when arrested on a drug charge, and be "recaptured" when he entered a treatment program.

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[1] It was first applied to estimating drug abusers by J. Greenwood (Greenwood 1971) and subsequently by various researchers (Bourne et al. 1975; Drug Abuse Council 1975).

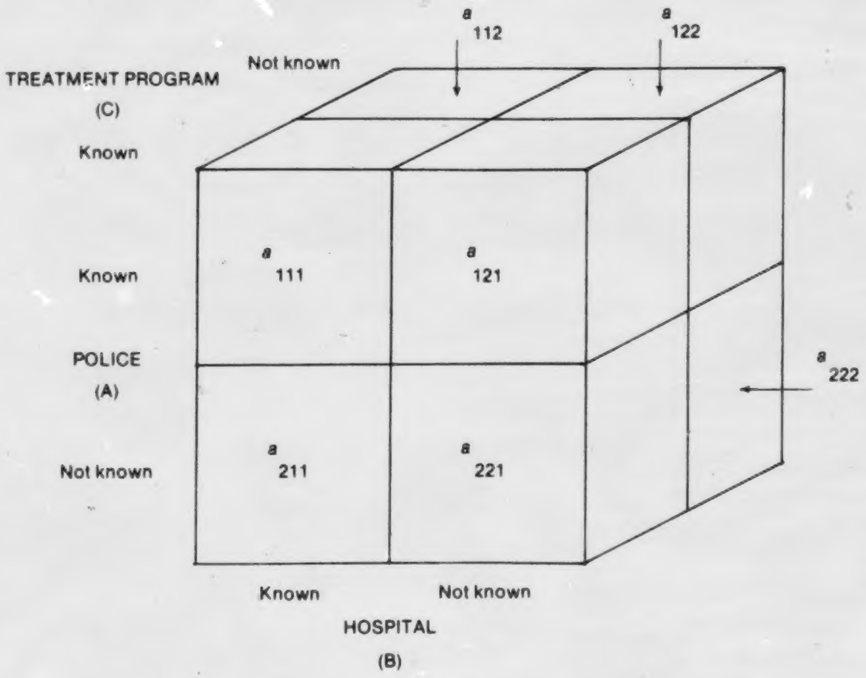
Such methods work only under rather restricted conditions. The most compelling requirement is that the two samples be statistically independent. This means that the probability of an individual being in both samples is the product of the probabilities of him being in each. This condition is seldom fulfilled in practical cases.

In the last few years, the basic idea has been greatly extended by a group of Harvard statisticians (Bishop et al. 1975). These researchers have developed a coherent theory of multivariate contingency table analysis, which, as one of its byproducts, permits the estimation of hidden populations using samples from any number of sources, whether statistically independent or not. The principle is slightly more complex than the preceding one. Consider three different community agencies which encounter drug misusers—police (A), a hospital (B), and a treatment program (C). Any drug abuser in the community has some chance of being known to one or more of these agencies, so that the total population of misusers is split into two groups for each agency—that which the agency has contacted ("known") and that which it has not. A three-dimensional contingency table classifies these individuals as follows:

The cell frequencies, $\underline{a}_{ijk}$, are the numbers of drug misusers in each category. For instance, $\underline{a}_{111}$ is the number known to the police, to the hospital, and to the treatment program; $\underline{a}_{221}$ is the number not known to police or hospital but known to the treatment program, and so on; $\underline{a}_{222}$ is the "missing cell"—the number not known to any of these three agencies. It is the population we seek to estimate.

By studying agency records, we can count all the $\underline{a}_{ijk}$ except $\underline{a}_{222}$. The technique of contingency table analysis permits a direct estimate to be made for $\underline{a}_{222}$ based on the mathematical relationships among the other cells. The underlying idea is to construct a model of cell frequencies which is a function of the cell means, plus main effects of each variable (dimension), plus interaction effects, somewhat in the manner of an analysis of variance. This model leads to an estimate of the size of the missing cell. Since interdependencies among all variables (interactions) are part of the model, sources need not be statistically independent.

The procedure of finding the appropriate model of cell frequencies is fairly involved, and it becomes



increasingly complex as the number of sources (dimensions) increases. For instance, with four sources of data on drug misusers, a cell-frequency model could include one or more terms for the mean, main effects, two-way interactions, three-way interactions, and a possible four-way interaction. In practice models are seldom this elaborate, but the testing of successively more complicated hypotheses to find the right model requires numerous calculations (since the maximum likelihood estimates of cell frequencies must be computed for each different hypothesis before it can be tested). Various computer programs (such as the George Washington University Department of Statistics' CONTAB software) have been developed to perform these computations simply and efficiently. They have been used in estimating other hidden populations (illegal aliens, Lancaster and Scheuren 1977).

Note that this technique yields not only estimates of the total number of drug misusers, but also shows which kinds (by sociodemographic characteristics) are being served by what institutions. Extensions of the same method also show the kinds of individuals who are *not* being encountered by each agency. Therefore the total result is to identify the number and characteristics of unknown problem drug users.

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special issues

Treatment is delivered to persons with drug problems by agencies which vary in size and complexity, but almost all of which are large enough to require skilled administration. Management must interface with funding sources and the community to obtain support and to give an accounting of funds and activities. It relates to treatment staff in hiring, firing, training, supervision, and the transmission downwards of regulations and requirements, or upwards of needs, hypotheses, and suggestions. It relates to research as a provider of data and a user of findings.

No brief chapter could hope to cover all aspects of all of these responsibilities, and in his chapter on management Deitch chooses to focus on the interface between the outside requirements impinging on management and the clinical mission of the agency. Dendy addresses the question of training, with emphasis on the Federal training program.

Swisher writes on prevention, a function of most agencies and the sole function of some. He advocates that the goal of prevention should not be total abstinence, as in the past, but prevention of abuse—use that produces negative consequences. In this position, he is in agreement with a wide, highly competent, and influential segment of the drug community and of the wider professional community.

His position is, for example, identical to Jessor's chapter on marihuana, and essentially the same as Zinberg's chapter on opiates. It is a specific recommendation by the Task Panel on Psychoactive Drug Use/Misuse of the President's Commission on Mental Health. They also cite a 1977 Federal interagency report, Recommendations for Future Federal Activities in Drug Abuse Prevention, as recommending that efforts be focused on moderating the effects of drug taking.

One basis for such recommendations is obvious. Large numbers of people are using various drugs. Large numbers begin use each year. We know no effective way to prevent their starting, and they are likely to continue until they choose to stop. Given that they are using, we should try to help them minimize ill effects of that use. And in one-to-one relationships with users, or with groups of users, experienced drug workers can provide such help through advice, specific information when it is lacking, or helping the user think through the possible consequences of use.

But what of nonusers, even including many who are likely to start use at some future time? Prevention efforts with respect to marihuana, for example, must begin no later than the junior high school years, and are often thought of in terms of mass education programs. In the junior high years, most youngsters have not started to use. How does one prepare those who will start for safe use, without implying to all that use is expected, and by inference acceptable?

As Swisher points out, any approach that in effect says "It's all right to use marihuana; just use it wisely," would probably be unacceptable in most communities today. Another problem would arise if the approach were acceptable; some teachers would face the question, "I'm going to try it. Tell me, how much (or how often) is it safe for me to use?" We believe that in the present state of knowledge no one can give a scientifically based answer to that question. Many feel comfortable with statements to the effect that there is no evidence of any ill effects on health from occasional use of marihuana, but statements of that type are answers to different questions.

These considerations apply with even greater force to other licit and illicit drugs, especially the opiates and cocaine, where those who ever use are a much smaller proportion of the population.

All of this is not to argue against the idea that prevention efforts should focus on the adverse consequences of use, rather than on use itself, but to point out that such statements are far too general. They do not address the issues that must be faced in putting the policy into effect. Wisdom at an abstract level can become folly in application, so careful thought must be given to how the policy can be implemented without causing new problems while solving old.

One aspect of prevention not considered by Swisher and others, or tacitly dismissed by them as a failure, is that of the legal sanctions on the distribution, possession, and sale of drugs. The legal system quite obviously has failed in prevention, with respect to drug users. But there are many more nonusers, and it does not seem incredible to us that the policy of prohibition and legal sanctions deserves some of the credit for that.

The issue is clearest with regard to heroin, and proposals to abandon the policy of prohibition and rely on social sanctions to control its use as they do alcohol use. Heroin, we believe, is a more addicting drug than alcohol, in the sense that the probability of addiction following experimentation or following a period of controlled use is greater for heroin than for alcohol. Yet we have some half million heroin addicts to millions of alcohol addicts.

One possible, and to us plausible, explanation is that alcohol has been legalized, socialized. It would then follow that if heroin were available on the alcohol model, we might expect millions of heroin addicts. It has been noted, for example, that there were many fewer alcohol addicts during the Prohibition years than there are now. Prohibition is not all bad. It has both good and bad features. On balance, it has probably been a socially useful policy for heroin.

As with the former point, we do not intend this as an argument for the status quo, and against all policy changes. Our present system has much wrong with it, and probably many changes would be improvements. But it has had some good aspects too, and some changes could be for the worse. We are not in a situation so bad that any change would be an improvement.

Policy changes, even far-reaching ones, should therefore be considered. However, they should not be made until real efforts are made to foresee their possible harms, as well as their benefits. Critics of the present system see that social policies can have unintended consequences worse than the problems they are intended to solve. But so can changes in social policy.

38. Program Management: Magical Expectations and Harsh Realities

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A year ago I was asked to provide technical assistance along clinical lines to a mixed residential and outpatient program whose clients and staff were predominantly minority. The program director was an ex-addict and the program was responsible to a larger mental health complex in the Midwest. The program had many components in different physical locations. Within a day and a half I observed a multitude of management problems. Executive meetings consisted of 12 people, no agendas were present, people arrived late, discussion was seldom focused, many conflicts were avoided, and a few differences of opinion consumed much of the meeting. Tasks were assigned to committees without naming an individual ultimately responsible for calling such meetings and with no date set by which to give feedback. Component staff meetings looked the same; counselors were frequently out of their offices, and others were clearly uncomfortable in middle management supervision roles. In short, it appeared that this program managed both clients and itself not by objectives but rather by gut and impulse.

However, in spite of all this management and clinical chaos, there was, indeed, an extended community of staff and clients, all staying relatively free from the use of opiates. Gossip and sexual liaisons among the staff members were daily occurrences, complicating supervision and creating tension. Counselors who knew little about family or couples counseling were constantly engaged in what I would politely call homicide prevention, little children were everywhere, and internal communication was done primarily by yelling. This was not an organized program, but rather a large "nutty" family grappling with staying healthy.

I observed everything I could—groups, intakes, case conferences (perhaps better described as staff scrabble), urine taking, files (they were a mess), etc. I talked with many, many clients, most of whom had split one or two times from the program but always came back. To them it was family; the process was not clear and consistent, but many described to me that they were using fewer and fewer drugs for longer and longer periods of time.

Now in came the Big Shots—State monitors, program developers, management consultants et al.—all of whom found the program deficient. They argued that it needed better management, better treatment plans, better discharge summaries, quantifiable objectives, and more orthodox looking counseling methods. So subsequent technical assistance was provided with a ratio of about 4 to 1 administrators to clinical staff. Six months later I returned to find people spending all their time dealing with monitor demands, i.e., files, operation manuals, and other kinds of paper, instead of with clients. What formerly looked terrible from a management systems point of view and wonderful from a humane ecology, social-clinical outcome point of view now had a better appearance. The question is, however, what is the clinical outcome of this new image?

When programs fail to produce desired goals, we are frequently told that they are management inefficient. In other words, when programs are plagued to do everything other than what they do best, i.e., treat people, they are blamed for failing to effectively treat. Regardless of how skilled the program managers are or how sound their practices, are we not setting up a straw man by suggesting that what is at fault in the field is the absence of program management? Of course, we must pay attention to management. Of course, many program leaders could do well to study management techniques. But the real question is, at this point in time, is management the source of critical problems?

Let's examine the other side of the coin. A year ago I was asked to conduct a training needs assessment of a large outpatient program in the Pacific Northwest. The program was highly structured. The chain of command was clear and conformed to, each unit had objectives and goals, staff meetings occurred with regularity and had agendas, policy directives were clearly posted. There were pertinent charts and operations manuals, and no staff member had less than a B.A. From a management standpoint, it appeared to be a superior program.

However, discussion with clients resulted in some startling facts. All were systematically funneled through all aspects of care, whether they wished it, or needed it, or not—from foot doctor, to eye doctor, to nurse, to M.D. at least once monthly and to their counselors weekly. This of course did generate funds for the program, but I don't know if it actually helped clients. Clients laughed at how whole boxes of urine samples were regularly stolen and replaced with clean urine and how folks traded symptoms and complaints in order to secure minor tranquilizers and sedative drugs. The program had street hours from 10 to 7 p.m., 5 days a week. All nondrug-specific issues, like family counseling, etc., were referred out to other equally sterile and even more formidable city agencies.

TAKING A PULSE READING

As a program evaluator and consultant, regardless of where in the country I have worked or in what type of program—department of psychiatry, community mental health center, methadone program, therapeutic community, or small private industry—I have been able to identify program management vulnerabilities and needs. Curiously, however, I cannot in fact say these management vulnerabilities or assets contributed to poor outcome or good outcome. Nor at this time can any local, State, or Federal agency offer any of us research outcome that definitively states that a specific management bias (style, methods, etc.) results in better client retention and outcome.

Across the country similar concerns are being stated by substantive and outstanding programs. I asked program managers to review their executive meeting minutes. Most told me that the great preponderance of time, energy, and focus for the last 2 years was aimed at dealing with money and government. They frequently stated that with appropriate resources they had been able to get the necessary management systems in place (treatment files, communication pathways, etc.), but had little opportunity (regrettably for the field and taxpayers) to review, refine, expand, or innovate the most critical issue of them all—clinical care.

Program management has a variety of meanings dependent on who defines it and the time frame when it is defined. In general, all agree that the function is needed. One's view of the function will generally determine who one thinks ought to fill the role and, consequently, how the role is carried out. Those of us who have, in fact, grown up in the field of drug abuse know that clearly there are benefits as a result of good program management. No one with experience questions the need for or the values of planning, rational authority, performance accountability, or the skill to engage and motivate staff. The questions in this chapter have more to do with the impact of time, social circumstances, and shifting Government demands on program management. Consequently, I shall address issues regarding both realistic and inflated expectations of program management, because these have varied with changing cultural premises.

THE MEDICAL MODEL

The program manager of the 1950s was typically an M.D., and the environment for which he was responsible was either a hospital unit or the hospital itself.[1] The norms and expectations regarding addict care were ancillary yet conformed to the traditional and established institutional management notions. As part of a medical model, addict care was conducted by professional personnel, all of whom knew their place in the medical hierarchy and had clearcut, well-defined job definitions, roles, and scopes of responsibility. Chain of command, policy, and procedures were determined from on high. Funds were provided for the institution as a whole without regard for the numbers of beds filled, or were in private proprietary hospitals occupant-related. However, the fee given the the hospital generally matched or better than matched the general hospital patient bed cost.

The manager did have a few headaches not unlike some still existing today. The major problem was one of community relationships. While waiting for admission and intake interviews, prospective clients heard such remarks as, "Those addicts are stealing anything they can lay their hands on." The chief of surgery was furious that needed syringes and scalpels were stolen; administration was howling at the loss of typewriters from under their noses; the chief of nursing was outraged about the successful con jobs carried out on her staff. The program manager did have problems, but these did not include raising funds, having the treatment environment ready to meet an onslaught of different evaluators, confidentiality, informed consent, Federal and State funding criteria, quality of care, and differentiated criteria regarding client progress.

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[1] Examples of this are USPHS hospitals at Fort Worth, Texas, Lexington, Kentucky, and a few proprietary hospitals in major urban areas.

NEW TREATMENT ALTERNATIVES: THE ERA OF STOREFRONTS AND OLD HOUSES, SPIRIT, AND COMMITMENT

By the mid-1960s drug addiction had become a hot issue, with increasing drug use of all kinds (not just opiates) stimulating a demand for increased treatment resources. Simultaneously, criticism arose from many levels addressing the failure of established programs to treat addicts effectively. In general, while most critics blamed traditional institutions and treatment methods, few offered either a social analysis or any examination of how to match client needs with particular treatment modes. Concomitantly, an attack was mounted against those who had been raised, trained, and employed in traditional hospital and welfare models. These practitioners were labeled uninterested, remote, defensive, and cynical about the addict and any positive treatment outcome. "Once an addict, always an addict" was a frequent whisper among their ranks, according to their critics. In short, they were indicted for their lack of spirit or commitment.

During this era a premium was placed on new, different, and alternative modes of treatment, and innovation was both invited and welcomed. Innovators and many staff members who were disenchanted with or guilty about performing traditional roles were attracted to the field by the air of great excitement and the opportunity to be a part of the impact on a grave social problem.

Program management at this time seemed to rest in the hands of either those most capable of generating money and/or those most capable of selling their product to clients, staff, and the community. Most of these program managers were charismatic, willing to work day and night, capable of attracting great loyalty or evoking great jealousy, and were, above all, willing to take risks. Their specific tasks and skills were directed at clinical, internal management. At this time there were fewer programs competing for resources and more available clients. A great deal of inservice training was required, conflict resolution between professional and ex-addict staff was in constant demand, and building the norms and folkways for both staff and clients was the major order of the day. If one did the above reasonably well and had either the skill or personnel resources to write grant and contract applications, money was made available.

THE INSTITUTIONALIZATION OF INNOVATION

For programs generally, issues like service documentation, treatment planning, case notes, organizational goals and objectives, and budget planning for other than care maintenance were either neglected or overlooked entirely. As programs rapidly grew both in size and numbers, little management planning developed about how to deal with the unique needs or separate life needs of either program components or different programs. As programs grew, members of the same team who once worked well together began to resent and compete with each other when placed apart. In addition, many managers confused policy and procedures. Frequently, management not only generated policy (as it should—preferably with input from the field of funders, clients, and staff) but also generated procedures. Many of these were relevant to the manager's experience and specific operational setting, but were not relevant to the unique characteristics (staff, client, and location) of their components. This rapid growth strained both accountability and feelings of membership by program staffs and different programs.

Most program managers (even those with minimal organizational training) knew the value of organizational charts and chain of command.[2] But what they and even the more sophisticated Government administrators and medically and business trained managers overlooked was the need for personal attention of staff, review of performance, and inclusion of the direction or focus of planning. The real difficulty was too much accumulation of information and too many diverse needs to be satisfied in a single meeting or even a series of meetings. It was quite common to see single program directors and city or other Government program coordinators act confused and frustrated at the "unending demand and failure to understand" present in their weekly meetings with their 15 component heads or program managers.

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[2] I have often been amazed at the colorful, full wall, organizational charts found in even the most alternative street agencies.

All of these and other critical management issues resulted in a lot of time spent on issues only tangentially related to client care, and, in some instances, single program blowups or critically dysfunctional conflicts between programs and Government funding bodies.

FROM STOREFRONT TO CHAIN STORE, IMAGE AND ALL

In the seventies program managers are now faced with a series of new problems as well as old. Some of these problems are already familiar.

Excessive Goals. Currently society and treatment funders demand that treatment programs get clients "well." This has taken on unreal proportions. Treatment agencies are now expected to provide social actualization, family reunification, economic job capability, educational actualization, and abstinence from illegal drugs. In no other health care or educational model do such ambitious expectations occur.

Lack of Agency Coordination. Programs are faced with accountability and evaluation demands, from city, county, State and Federal agencies. Not only are many of these demands overlapping, but most are irrelevant from the point of view of program need and actual accountability to funders. Finally, from a management point of view, these unending and ever-growing demands are poorly coordinated and unbelievably redundant. In short, they are management inefficient.

Reduced Societal Interest. There is currently a new class of individuals coming to work in the field, some of whom bring generalized skills from other experiences. While such skills could be of value, they are less than helpful when applied without understanding the unique aspects of drug treatment service and its consumers. Others are only interested in work benefits, insurance, and retirement plans. This new class brings with it professionalism, but far less of the passion to make an impact than existed in the 1960s.

Facility Obsolescence. Facilities located and frequently purchased in the 1960s which at that time conformed to building regulations are now in desperate need of maintenance and repair and, in a number of instances, require major renovations because of changes in those earlier regulations.

Inflationary Cutbacks. In the face of rapid inflation and funder inability to provide cost of living increases, 20 to 40 percent de facto funding cuts have developed.

Paper Overload. Programs are being asked to do routine data collection, assessment, research, and followup, typically without there being adequate provision for feedback of findings to those same programs. Much time and energy, then, has been devoted to bureaucratic paperwork and taken away from client treatment.

Competition for Clients. Complicating all of the above (inasmuch as there are many more treatment resources in operation), programs must now as never before compete for clients to maintain matrix funding levels. This occurs at a time when we were just beginning to make rational inroads against the absurd notion held by many programs that they could "fix" everybody.

Client Choice and Consent. Unintentionally exacerbating all of the above is the ever-increasing reliance on criminal justice referral.[3] More and more clients are being coerced into treatment without full knowledge (informed consent) of what the different treatment models really are. This diminished informed and free choice is impacting on client retention and outcome.

A tremendous myth exists at local levels. It sounds like this. If only there were good management techniques, programs would have fewer crises. Let's ask a few questions relevant to this myth. How can good management technique offset the turbulence in the field? For example, can such techniques overcome unexpected budget cuts at the local county level, lack of stability at the single State leadership level, repeated cash flow shortages as a result of political conflict between county and State, or between State and Federal Governments (failure to sign contracts, turf war over administrative overhead), and lack of middle management support staff to cope with increasing bureaucratization which then impacts on executive management time and impacts on direct service provider time? A frequent target for criticism is funding philosophies that are in direct contradiction to the most contemporary treatment philosophies i.e., funders are saying you can only treat the drug-connected issue or individual (Federal funding criterion) as opposed to, for example, relating to and treating the client's children or spouse.

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[3] For example, Robert L. DuPont, in his paper "Trip-Wire," presents highly rational notions of how justice can be used as an intervening force with escalating steps when clients manifest drug use. Although his proposal reflects desired social values, such coercion could compound the problem of client retention unless implemented with high levels of clinical skill.

Can management techniques, regardless of how sound, really provide us at the local program level with skills to assess client need, treat such need, do research on effectiveness, and, finally, follow up as well as raise money? How can a program manager, who must see his staff scramble to keep the matrix "up," insist that careful assessment of client need occur to see if their resources are, in fact, best for the client? Can good management techniques offset the eventual demoralization of those very managers and their staffs when the current funding structure puts a premium on client numbers and the cheapest, easiest way to provide treatment?

There is, of course, no question that programs can benefit from good management. Program managers have three categories of obligation. First, they must create an effective treatment environment; second, they must keep that environment accountable; and, third, they must do all that is possible to protect that environment. There are countless problems of an internal nature: the need for greater understanding and training of both degreed and non-degreed staff; conflicts between lifestyle choices and new job roles; the impact on the treatment ambience of alternative services when they become a service industry; shifts in new client characteristics (many of which are contrary to the adopted lifestyle of the helpers—radical chic vs. new conservatism); new crisis of confidence and self-doubt (we kept saying we had the answers, now we no longer know for sure). There is the need to create structure for routine in order to free up creativity; the need to generate feelings of membership among staff and clients; the capacity not only to generate objectives and plans to meet them, but also to maintain the openness to continually review them for ongoing relevance. There is a great need for organizations to be structured not only for staff to be held accountable, but also for them to give appropriate personal and clinical attention. In addition, management must constantly guard against the slow erosion of diversity among staff members. The greater the racial, ethnic, and educational variety within the staff, the more flexible and responsive it will be to client need. These are but a few of the internal issues.

It is clear that most signals from Government insist we move from innovation, that we replace the spirit of the 1960s with the structures of maintenance. We do this not because of "cures" or concrete answers to the many questions regarding treatment, but rather because it appears that with less money, this is the only way Government knows how to administer to the diverse segments of our culture who insist on autonomy.

The treatment systems in drug abuse might have revolutionized the mental health field. In the beginning, we challenged Government's answers, found them lacking, and so created new institutions. But as these institutions become firmly established, the multiple funder management pressures now acting dysfunctionally on the field must be ameliorated. Surely the current social and political climate supports Government to conduct research on different management models. This research could have outcomes of value to the entire health care field.

I do not propose a shift in Federal regulations since such regulations have proved to be of value. I am proposing a new look at role and task distinctions which would result in both a reorganization and a redistribution of responsibility. For example, one of the models for research could be the creation of a central authority and resource entity in a region where large amounts of treatment dollars are being expended. This entity could act in the following capacities: perform all intake, client need assessment, and referral; do outcome research and followup; program accounting, etc. This would free the program staff to do what they do best: treat people. Research with less bias could be conducted, not only on outcome effectiveness, but also on what clients seem to fare best in what treatment modalities.

At first glance, it would appear that whoever did this, whether the Federal, State, or local governments, would be assuming too much control over local options. However, there is a strong possibility that such a model would ultimately result in local programs being less controlled, simply by a reduction in the net numbers of bosses and conflicting or redundant demands. Research on such models could result in more efficient management, better treatment, and money saved by reducing duplication (of accountants, researchers, followup workers, etc.). These savings could be directed to clinical care enrichment. This, of course, should be done with Likert's interaction-influence principle in mind; simply translated, it suggests that Government must permit input from local programs into the design of such a central resource system. Finally, Government must remember that, if it is to insist on good management, it needs to provide resources for good management.

In the meantime, manage we must—not only because it is an executive function to see that institutions are stabilized so they can outlive their leaders, but also because if we don't, in the current scheme of things, only jails and chemicals will be left.

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39. Developments in Training

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National Drug Abuse Center for Training and Resource Development

INTRODUCTION

Since the establishment of a Special Action Office for Drug Abuse Prevention (SAODAP) within the executive branch of the Government in late 1971 and a subsequent enactment by Congress of the Drug Abuse Office and Treatment Act of 1972 (Public Law 92-255) establishing the National Institute on Drug Abuse (NIDA), the Federal Government has maintained a leadership role in confronting the national problem of misuse and abuse of drugs. This role has been characterized by vigorous research into the biomedical, clinical, behavioral, and psychosocial variables or causes of drug abuse and by development of drug abuse prevention, treatment, and rehabilitation resources throughout the country. The underlying intent at the Federal level has been to provide help for any person seeking it.

Public Law 92-255 called for the establishment of a National Drug Abuse Training Center to develop, conduct, and support a full range of training functions for Federal, State, and local government agencies. Training materials and resources were to be provided for medical and paramedical personnel, treatment service workers, educators, and for the public at large. Also included in the target audience were drug-dependent persons who may require training or education in drug abuse prevention, treatment, and rehabilitation methods.

Early in 1973, the Manpower and Training Branch, Division of Resource Development, began a process aimed at integrating all NIDA-funded training into a National Training System. Two factors necessitated this integration: First, although there were a number of effective training programs in operation, a vast majority focused on traditional academic training for professionals which left many paraprofessional workers with unmet training needs; second, each program was a unique and isolated training effort with little, if any, sharing of resources.

Prior to the proliferation of drug abuse treatment programs in the late 1960s and early 1970s, little attention was given by most physicians and other health professionals to the treatment of drug abuse as a medical or health problem. Drug abuse was generally considered a sociocultural phenomenon which would somehow be resolved through social policy, law enforcement, and general education of the public. Indeed, most health professionals were not adequately trained or prepared to engage in drug abuse treatment regardless of their philosophical orientation or cultural biases. As the number of drug treatment programs began to multiply, relatively few physicians and other professionals began to engage in drug abuse treatment. The traditional medical model, however, remained as the frame of reference for most treatment programs. Meanwhile the experiences of some of the former recipients of these services indicated that there might be alternative approaches to treatment. Nontraditional methods were explored which used ex-addict clients as service workers. Thus, a whole new generation of caregivers emerged—the ex-addict, paraprofessional treatment workers. By and large, the bulk of treatment in the early to mid-1970s was conducted by paraprofessionals who emphasized psychosocial therapeutic techniques and who experimented with nontraditional and innovative treatment models.

The use of paraprofessionals in human service began receiving attention in the literature in the mid to late-1950s and the practice gained reluctant acceptance in traditional mental health settings by the mid-1960s. With the increased use of paraprofessionals there was an inherent and unchallenged need to develop training models for these workers. Most paraprofessional training models were extensions of *academic programs which emphasized theory* and concepts in didactic presentations with occasional extended supervised practica.

By the late 1960s and early 1970s it became apparent that these approaches to training were inadequate, particularly in the growing specialty of drug abuse treatment. In fact, drug abuse was considered such a unique phenomenon that almost any approach to treatment having any semblance of traditional or established practice was rejected both by many of the clients and most of this new generation of caregivers. Many professionals simply assumed they had knowledge and skills because of their academic training, but this often was not the case. Conflict between professionals and paraprofessionals regarding their respective roles and expertise in the treatment of substance abusers had become an increasingly more frequent problem. It was axiomatic in those days that one had to be indigenous, with lifestyle and life history experiences similar to the client population, in order to be effective. This proved true only insofar as the goal was the establishment of rapport and trust, or where a viable role model was required. Other skills such as counseling techniques and an understanding of intra- and interpersonal dynamics were needed by the paraprofessional in order to effect treatment outcomes for the client. Even though some paraprofessionals may have had more specialized training and experience than professionals in the drug abuse field, it is currently accepted that both the ex-addict treatment worker and the professional have skills that are complementary rather than incompatible. When combined they can work rather effectively toward appropriate treatment outcomes.

The 1976 National Drug Abuse Treatment Utilization Survey (NDATUS) identified nearly 60,000 drug abuse treatment workers in almost all of the treatment programs around the country. About 31,000 are full-time paid staff, but over 1,000 are full-time volunteer workers, 15,000 are part-time paid staff, and 13,000 are part-time volunteer workers. The number of physicians, including psychiatrists, totals 4,000—but only 600 of these physicians are full time. There are about 2,500 psychologists, over 3,000 social workers, and nearly 5,000 nurses. That totals 14,500 professionals out of 60,000 drug abuse workers. The majority of clinic staff other than the professionals listed above are counselors—nearly 20,000 in all. Nearly 23,000 more are administrative support and other personnel such as vocational specialists, clergy, medical technicians, student assistants, and pharmacists. These data point to the importance of the "nondegreed professional" as the backbone of the drug abuse treatment effort. The large number of part-time and volunteer workers demonstrates the strong community involvement and attractiveness of drug abuse treatment. The NDATUS data also dramatize the need for the training of drug abuse workers in an ongoing and systematic program. This is particularly true from a Federal perspective.

THE NATIONAL TRAINING SYSTEM

Until 1973 training in drug abuse was too often developed on an ad hoc basis as a response to specific crisis situations. There was no time to suspend activity while a full-fledged training program was being designed, and a training system had seemed out of the question. Because of the circumstances surrounding training, NIDA was forced to experiment in a new field of training. As a result, the Institute learned that to be effective, drug abuse training must occur in an environment of mutual involvement between trainer and trainee. To meet this goal, NIDA established the National Training System (NTS).

The NTS's components currently include the National Drug Abuse Center for Training and Resource Development, the Career Development Center, five Regional Support Centers, the Medical Career Teachers Program, the State Training Support Program, and numerous operations funded through developmental training grants and research fellowships.

The National Training System has instituted three processes within all NIDA-funded training efforts: training needs identification, resource identification, and resource exchange. Programs having the most severe training needs are given priority when new grants and contracts are being let. All training resources are concentrated on meeting these needs. In addition, information exchange mechanisms have been set up so that training activities can build on and utilize existing resources rather than start from scratch.

During the early days, the National Training Center was a laboratory type of training facility where drug abuse personnel from around the country came to Washington, D.C., for short periods of time for exposure to "experts" and intensive experiential style training. The effectiveness of this approach was limited, as the training seldom had focus and the number of participants was very small considering the number of personnel who needed to be trained.

There were five Regional Training Centers which used some of the approaches to training developed at the

409-4

National Training Center. These centers met with the same limitations in terms of the cost effectiveness of the residential style training and the limited number of workers who could receive training at any given time.

Increasingly, large numbers of treatment personnel, both professionals and paraprofessionals, had to be trained in short periods of time. As the demand for training increased, so did the need to develop training materials and training methodologies which were skill specific and job related. Training not only had to be attractive and appealing to the treatment worker but it also had to be cost effective and promise positive program impact for the program administrator.

Two separate, but interdependent, systems needed to be developed in order to answer, efficiently and effectively, the demand for training. Both systems had constraints and limitations inherent from within but the problems were not insurmountable. One system had to address the issues of delivery of training, that is, who is to train whom, where, when and under what conditions? The training delivery system had to be flexible enough to offer training to those who needed it most, and it had to be conducted as close to the work environment as possible. The system also had to stimulate career development for nondegreed professionals by promoting external-degree programs and nontraditional educational opportunities. In order to do this, standards needed to be set which could ensure the quality of training and the outcomes of training, regardless of where the training was conducted and by whom.

The second system which had to be developed centered on the preparation, development, production, and distribution of training materials. The challenge here was to develop training materials which reflected the "state-of-the-art" and "best accepted practice" rather than perpetuating myths, stereotypes, and the opinions of a few. The technical content of the material had to be written at a ninth grade reading level and without cultural or regional bias. Training materials for professionals, particularly physicians and other medical personnel, had to be approached differently. Not only did the technical content have to be on a par with standard medical journals, but the method of training had to allow for a continuing medical education that physicians could engage in at their convenience, rather than a structured training event that would demand more of their time than was practical. In order for the training to be replicated with similar outcomes each time, each course that was trainer mediated had to have a trainer's manual that provided the trainer with guidelines and suggestions on how to conduct the learning activities.

The training delivery system and the training materials development system experienced growing pains during the first few years but became more effective and functional in early 1976. Aside from learning by successive approximation, the consumers of training were clearer in articulating their needs, and the providers of training became more realistic and responsive in meeting those needs.

One of the major problems encountered in developing training materials for a broad-based national audience was not only trying to account for regional, local, and cultural differences, but also trying to account for differential skill levels, previous training, and educational levels of potential trainees. The training materials had to be designed with enough latitude so that adjustments and modifications could be made in the training objectives and level of content depending on the unique needs of the participants. This was accomplished in part by a systematic assessment of training needs of treatment personnel who had job functions in common, and by consultation with experts who had an understanding and knowledge of the skills required to perform certain job functions. It was further accomplished by preparing training objectives (the skills, knowledge, or attitudes) that potential trainees would acquire as a result of training. The training objectives were written in specific measurable terms so that a competency based assessment could be conducted prior to and/or following training.

The training objectives were sequenced in the instructional design of the courses to lead from a simple understanding of concepts to a more complex application of the concepts under simulated conditions. The courses were designed so that the participant took an active role in the learning process whether it was role playing, simulation exercises, or discussions. In other words, lecturing had to be kept to a minimum and exercises and games developed which would engage the adult learner in a manner that was challenging and fun, not demeaning or boring.

The training objectives and learning activities were also clustered in suggested time frames which allowed for an entire course to be delivered either continuously during an intensive 1-week workshop or intermittently over a longer period of time during inservice staff development training in a clinic or treatment program. Current experience indicates that as the training materials and training concepts gain

409-B

credibility and acceptance in the field, the latter approach, inservice training, will tend to predominate.

To meet the unique training and educational needs of medical personnel, a Medical Monograph Series was developed with issues that focused on diagnosis and evaluation, treatment (both short term and long term), emergency treatment, toxicological and pharmacological effects, program administration principles, and prescribing practices. Each issue in the series can be read in 2 to 3 hours or can serve as the basis for an inservice workshop. Each issue also contains pre- and post-tests on the technical content with questions similar to those found on medical board examinations. As a further inducement to physicians, Continuing Medical Education Credit (Category 1) can be obtained by submitting the post-tests to the Baylor School of Medicine, Career Teacher Training Center, a NIDA-funded training grant.

From 1973 through 1978 the National Training System has produced more than 20 courses. Each of the courses contains learning units or modules which may be arranged in various sequences or "mixed and matched" in different combinations depending on the characteristics and needs of the training audience. The courses as packaged are trainer mediated and range in duration from 27 hours to 50 hours.

Although the original intent of developing the courses was to upgrade the skill level of paraprofessionals and improve the quality of care in treatment programs, participants in the training have included counselors, social workers, psychologists, managers, administrators, evaluators, nurses, physician's assistants, and physicians. Content and scope of the courses tend to fall into four broad categories:

1. Skill development and process training such as counselor training, vocational rehabilitation, women in treatment, program evaluation, and training of trainers.

2. Program development such as management skills, administration principles, and prevention programing.

3. Technical development such as facts about drug abuse, medical treatment, and emergency department drug abuse treatment.

4. Interpretation or implementation of Federal regulations such as confidentiality, methadone regulations, and Federal funding criteria.

It should be noted that academic credit has been recommended by the American Council on Education for most of the courses if they are delivered by a NTS certified trainer.

While the system for developing training materials began to function, the system for delivering the training began to take shape. Regional Support Centers, which brought qualified trainers closer to the treatment setting, replaced the Regional Training Centers. There are now five Regional Support Centers, each serving approximately 10 States. Their primary mission is to train trainers at the State and local level, provide consultation in the planning, designing, and implementation of State training systems, and to identify State training resources and encourage the cross fertilization of training resources.

The NIDA contracting mechanism reflects a collaborative process between the various elements of the National Training System. Out of the system grew the State Training Support Program (STSP) also funded by NIDA's Manpower and Training Branch. The STSF was the next logical extension to the National Drug Abuse Center and the Regional Support Centers in that the STSP has better access to the training needs of treatment personnel at the local level. The STSP works within the structure of the State Drug Abuse Authority (SDAA). In addition to identifying training needs and providing training services within the State, the STSP is responsible for providing assistance to SDAAs in developing credentialing structures and in implementing processes to evaluate the effects of training on job performance. As the materials development system began functioning smoothly and standards were set, training materials, which needed only minor modification for a national audience, were being developed at the local and State level. With the bulk of the training now being delivered through the STSPs, the National Training System has the capability to train upwards of 10,000 drug abuse workers per year.

There are four additional National Training System components which address specialized training needs of drug abuse personnel:

The Career Development Center functions to raise the standards of drug treatment by providing nontraditional educational opportunities to drug treatment staff. This Center has worked with over 30 colleges and universities to introduce skills development curricula into their course offerings.

The Physician Education Program provides support to medical school faculty members who need to

409-C

receive specialized education in the diagnosis, evaluation, and treatment of the drug-abusing patient. The program has worked with the National Board of Medical Examiners to introduce drug abuse and drug treatment issues in their final M.D. examination and Specialty Board examination schedules. It is also assisting the National Board in the development of a comprehensive qualifying examination to be administered to physicians before they begin their residencies. The program is also conducting a survey of medical, dental, and nursing school curricula to determine substance abuse content.

The NIDA Training Grant and Research Fellowships Programs provide for undergraduate, graduate, and postdoctoral support to persons employed or involved in the drug abuse field.

The NIDA International Training and Support Program which, in cooperation with the U.S. Department of State, provides assistance to drug abuse prevention, treatment, and rehabilitation efforts in other nations.

IMPLICATIONS FOR RESEARCH

Even though the National Training System has evolved as a unique, dynamic, and creative approach to improved quality care, additional research, evaluation, and thoughtful study are needed before the evolution is complete. A series of studies need to be conducted, for example, which will identify emerging patterns of service delivery and the manpower skills required to effect desirable treatment outcomes. Other studies may indicate manpower shortages and training needs by types of programs, by personnel skill areas, by geographic areas, or by client service groups (particularly minority groups). A manpower information system is needed which will compute and interpret data pertinent to manpower utilization and turnover and which will produce trend indicators relative to existing personnel, inservice training needs, career development, and the rate of attrition of workers in the field.

Research is needed, both of a case study descriptive nature and experimental design type, which evaluates the impact of training on the trainee. One aspect of training for the human services which distinguishes it from any other kind of training (for example, that of a mechanic or even a brain surgeon) is the influence it has on personal growth as well as professional development. Too often the critics of training want to know either the quantity of training (how many were trained in what period of time for how much money?) or the secondary or tertiary recipients of training (how was the client, the client's family, or society impacted as a result of training?) as a means of getting at the quality of training. There is a natural tendency for many program administrators and policymakers to expect the same kind of "miracle cures" from 40 to 60 hours of training as do clients from 40 to 60 hours of treatment. Additionally, there is often the misleading perception that training alone will produce better treatment outcomes. The training of one counselor in a program of 20 counselors will probably have very little impact on the outcome of treatment, unless that counselor has a great deal of influence on the organizational structure of the program. When a counselor returns to his/her program from training, there may too frequently be social or programmatic disincentives which prohibit him/her from practicing the new skills. Organizational behaviors and program procedures often may affect the outcomes of treatment as much as the lack of skills of individual personnel. There are indications that further studies are needed which compare the effects of systematic inservice training of entire staffs by job function and level of responsibility as compared to training of workers selected at random or at the discretion of the program administrator.

IMPLICATIONS FOR TREATMENT

In addition to the above points and the obvious implications of the effects of training on treatment, consideration needs to be given to training as a mode of treatment. When the objective of training for counselors, for example, is to develop helping skills in the affective domain which enable the counselor to be aware of how his/her feelings, attitudes, and values may interfere with or facilitate the helping relationship, these same skills may be learned and used by the client in his everyday interpersonal relationships.

If the counselor needs to learn how to help the client identify the client's various strengths and weaknesses in order to develop an appropriate treatment plan, the client may engage in that training as a way of participating in his/her own treatment plan. If a program manager needs to learn how to budget and allocate resources for his staff, the same skills may be needed by the client for managing his family or his job. If a treatment worker needs to learn group process skills and how to manipulate a group or individuals within the group toward behavior which is mutually rewarding, the client may need the same skills outside treatment. In other words, training, as treatment, need not be viewed as a unidirectional, static, one-shot, stop-gap event. It can be, and is, a multidimensional, dynamic process which impacts on all who participate and which can be extended and generalized beyond the simple training event.

409-D

IMPLICATIONS FOR TRAINING

While the Federal Government, through NIDA's Manpower and Training Branch, has taken the initiative and provided vital leadership through major contracts with the National Training System, much untapped and unshared learning has occurred through the smaller grant structure and within the unfunded private sector.

As effective as the National Training System has become to date, it still has to address and resolve the issues of

- Competency-based training where the outcomes and skill levels are universally accepted;
- Any combinations of life experiences, academic training, nontraditional training, and demonstrated skill competencies which will fulfill credentialing requirements;
- Agreed-upon credentialing processes;
- Standards and procedures for trainer certification;
- Strategies for trainer development and the training of more generic process and specialist trainers;
- Developing systems and procedures for adapting existing training materials and courses for use by specific ethnic, regional, and local groups; and
- Developing a sensitivity and a need for learning from the international community.

Whatever the outcome, we have a lot to look forward to if the accomplishments and developments in training in the next 5 years are of the same order of magnitude as the past 5 years.

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40. Prevention Issues

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INTRODUCTION

Prevention of drug abuse has been fraught with controversy since being thrust into the national limelight during the late 1960s (DeLone 1972; Halleck 1970). The field has been questioned externally, as well as from within its ranks. Legislators, for example, want evidence that prevention makes a difference. Prevention professionals, conversely, have considerable difficulty agreeing on how to demonstrate the effectiveness of various prevention strategies. There is also considerable confusion regarding the differences among treatment, intervention, and prevention efforts. The greatest confusion centers on the distinctions between primary and secondary prevention.

Another major area of debate concerns the purpose of prevention with regard to target audiences' ultimate use or nonuse of a range of substances. Within the field there are a multitude of techniques and approaches and little agreement as to the best approaches to employ for what purposes. Determining which agency at what level of government has responsibility for the field, as well as the interrelationships between this and other social problems (e.g., delinquency, highway safety) is another significant concern. This chapter attempts to address several of these issues and to suggest possible direction for future efforts in the field.

CONCEPTUAL CLARITY AND GOALS

One area of confusion in the field arises from the lack of adequate differentiation among prevention, intervention, and treatment. Caplan's (1974) concept of primary, secondary, and tertiary prevention, while heuristic in the field of mental health, is not adequate for use in drug prevention program planning today. The major reason is that Caplan's definition cast primary prevention in the role of early diagnosis, whereas primary prevention is currently defined in the field of drug abuse as planned activities that occur before the earliest sign of, or onset of, any problems.

A variety of concepts have been proposed to define prevention as those activities occurring before the fact including: positive prevention[1]; mental health promotion (Wiggins 1976); enhanced development (Vicary 1977b); alternatives (Cohen 1971); and personal and social growth (Prevention Branch, National Institute on Drug Abuse 1977). All of these concepts emphasize stimulating an individual to reach a high level of functioning which when achieved presumably will prevent problems associated with drug use (Swisher 1976). The assumption is that enriched personal and social development will serve as an immunization against problems and negative consequences associated with drug abuse. This positive view of prevention was recently endorsed by approximately 20 professionals representing a range of views in a policy review session held at the Office for Drug Abuse Policy.[1] This position, which is now dominant in the field, suggests a different approach and importance for prevention activities. If a prevention effort is going to have an impact before the onset of a problem, the field will need to plan for the systematic dissemination of information; functions of communities, families, and schools; affective education for targeted individuals; as well as influencing decisionmaking processes and encouraging participation in alternatives. A positive approach to prevention will necessitate careful planning for use of, and coordination of, all resources available. Suggestions for this type of activity are discussed in another section of this chapter. Prevention in this context cannot afford

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[1] White House Seminar on "Primary Prevention," held in December 1977 at the White House.

TABLE 1.—*Differences among primary, secondary, and tertiary prevention*

Timing	Activities	Terminology
During later states of abuse	Treatment Institutionalization maintenance Detoxification	Tertiary prevention
During early stages of abuse	Crises intervention Early diagnosis Crises monitoring Referral	Secondary prevention
Before abuse	Education Information Alternatives Personal and social growth	Primary prevention

to be only a "community hot line" or single PTA program.

In order to accomplish better planning and coordination it will be necessary to differentiate clearly among the various program-response options. Table 1 proposes a conceptual basis for defining three basic thrusts within the total field.

If the field at all levels were to formally adopt some form of the above distinctions, several advantages would be realized. One major advantage would be that secondary prevention could be developed, supported, and evaluated as a distinct type of professional activity. Minority groups, whose youth in some circumstances are highly vulnerable (high risk), could apply for the type of support which at present is greatly lacking, in part because it is confused with primary prevention. Furthermore, many minority groups have been concerned with the alleged middle-class bias of most popular primary prevention projects, and consequently they have objected to many activities being developed for use in their communities. A programmatic and funding differentiation between primary and secondary prevention would allow for more resources of an appropriate nature (probably secondary prevention) to be channeled into high-risk areas, without necessarily reducing further development of primary prevention efforts for all populations.

If primary prevention is concerned with planned activities before the fact, it is important to define what is to be prevented. The meaning of the concept, drug-abuse prevention, has been equivocal because of various professions that are involved in the field (Zinberg 1976). For example, medicine has defined abuse as occurring when an individual fails to follow a prescription or engages in self-medication. Law enforcement defines abuse as any use of illicit drugs, whereas the social sciences might define abuse as that use which is harmful to the individual or to society. For purposes of this chapter, the social sciences position is the context in which the term abuse is defined.

The latter point of view is generally more acceptable for prevention planning; but attemping to define "harmful" requires another judgment. In fact, the legal, medical, and the social sciences positions all require that some judgment be made as to when drug use becomes abuse. Therefore, it becomes important to define what is meant by negative consequences. The definition for adverse consequences proposed in White Paper on Drug Abuse (Rockefeller 1975) referred to the following categories of results: illness and death; acute behavioral effects (e.g., paranoia); chronic behavioral impairment (e.g., apathy); intellectual impairment; injury or death associated with conditions of use (e.g., nutrition); developmental difficulties (e.g., adolescent crises); barriers to social acceptance; adverse consequences to society. The potential list of adverse consequences is enormous, but one that must be added is that being arrested for marihuana or other drug use may be more harmful than using any of the drugs in question.

It is important to recognize that a goal of abuse prevention represents a major shift in thinking away from an earlier position, implicit or explicit, of attempting to foster total abstinence. This point of view if adopted would necessitate extensive efforts in the public and professional realms to make explicit the objection of prevention of abuse as opposed to prevention of use. If this position becomes acceptable, it follows that prevention efforts should attempt to foster responsible choices regarding the consumption of all drugs for all ages. One responsible choice for a particular individual may be not to use any drugs outside of medical prescriptions. The vast majority of the population presently make responsible choices for readily available drugs. The goal of drug-abuse prevention would be concerned in part with maintaining the above two categories of decisions, as well as assisting others who might choose to use potentially more harmful drugs. Regardless of the drug status of the individual, prevention is concerned with those activities that will preclude negative consequences from use of drugs.

However, the professional literature does not provide clear answers regarding how to accomplish the objective of responsible decisionmaking. Furthermore, on a one-to-one basis it would be difficult to prescribe "safe" procedures for many drugs. While it may be relatively easier to work with individuals or in small groups, fostering responsible decisionmaking for the masses would be even more complicated. Finally, even if it were possible to achieve this type of outcome, many communities would be opposed on religious or political grounds.

DUPLICATION OF EFFORTS

As noted above, the field of drug-abuse prevention has adopted an approach which emphasizes enhancing the personal and social development of the individual as a means of preventing adverse consequences associated with use of drugs. The major themes that are frequently included in this type of approach include:

1. Increased self-understanding and acceptance through activities such as values clarification, sensory awareness, decisionmaking, etc.

2. Improved interpersonal relations through activities such as communication training, peer counseling, assertiveness training, etc.

3. Increased ability to meet one's needs through social institutions.

These three emphases form a core of growth potential as a foundation to which specific prevention activities, such as information dissemination, should be added. Figure 1 presents a core of prevention activities which are prerequisite to the ring of problem-specific prevention efforts.

In the illustration, the National Institute on Drug Abuse or any other local, State, or Federal agency concerned with drug abuse might be responsible for funding an entire project (core and ring) based on this approach. However, several other governmental agencies have similar prevention philosophies. The White Paper on Drug Abuse (Rockefeller 1975) listed 11 agencies and programs at the Federal level that are involved with prevention projects based on a similar philosophy. Examples of these agencies and programs included: Law Enforcement Assistance Administration, Drug Enforcement Administration, Office of Education, Dependent School System, and Runaway and Truancy Programs. Another group of approximately 25 Federal agencies have been meeting as an ad hoc committee on prevention for the last 3 years. At a recent meeting at the Office for Drug Abuse Policy,[2] approximately 60 agencies at the Federal level were identified as having an interest in prevention. While it is useful for different agencies to agree on philosophy, it must be recognized that several funding agencies may be simultaneously funding the development, delivery, and evaluation of programs that, except for the titles and some of the items in a questionnaire, may be extremely similar. If these programs are in the same community, they may also be competing for the same clients. It would be far better to have several interested and concerned agencies join together in a more coordinated and potentially effective fashion. Figure 2 graphically represents the potential sharing and savings if several agencies were to combine their prevention efforts.

In this illustration, each agency would only be responsible for its fair share of the costs of the core and its part of the prevention-ring activities (Swisher 1976). In terms of program time (e.g., school curriculum) devoted to each of the social problems, the chart also could serve as a guide to what percentage of time to devote to each topic

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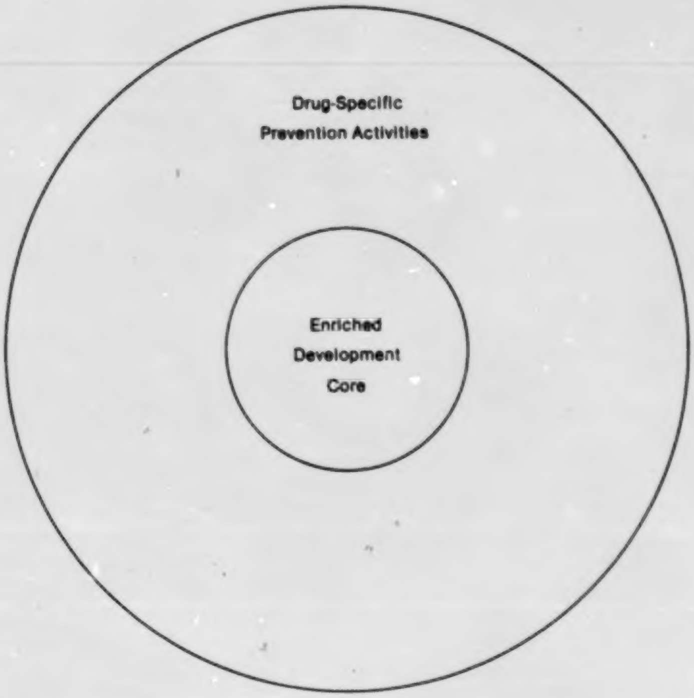
[2] White House Seminar on "Primary Prevention," held in December 1977 at the White House.

FIGURE 1.

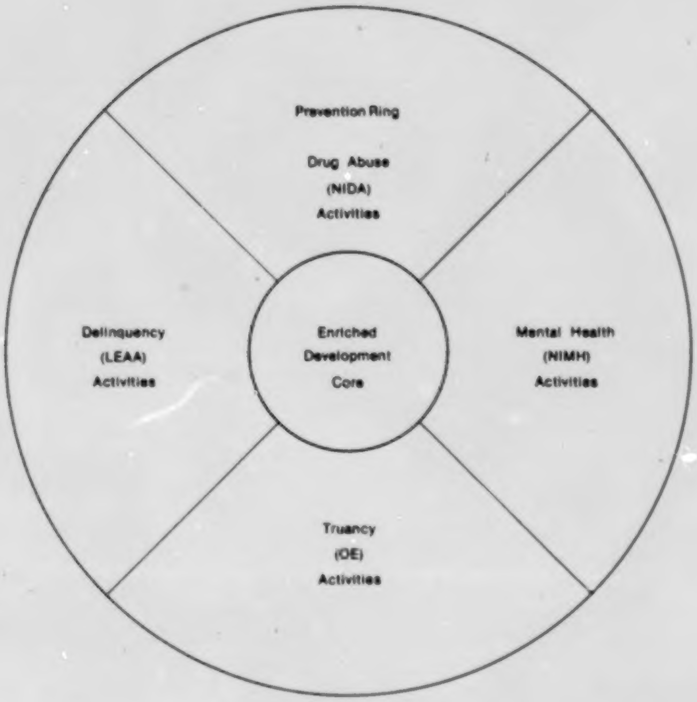


(i.e., delinquency, mental health, truancy, and drugs). Furthermore, several other agencies could be added to the support of a particular project with only minimal changes in the program activities. Probably there is a maximum number of agencies that could be involved in a combined effort, but such a decision should be derived from experience coupled with evaluation.

There is also a significant professional movement which lends further support for the development of interagency efforts. Several States have formed professional associations of individuals who are concerned with the prevention of different social problems. For example, the Commonwealth Prevention Alliance in the State of Pennsylvania is an active group of professionals representing a variety of agencies, all of which are concerned with primary prevention. At the national level a new organization known as the National Association of Prevention Professionals held its first annual convention in 1978, and there has been an active International Prevention Alliance for several years. This type of activity suggests that there are professionals seeking effective leadership to challenge them to implement coordinated prevention programs that encompass more than one particular social problem.

From the point of view of the client populations, an individual who selects a potentially harmful form of behavior has many options available at almost any juncture. These detrimental choices might include drug abuse, alcohol abuse, delinquency, sexual deviancy, bizarre mental behavior, etc. The option or combination of options chosen by a given individual is probably not predestined, but rather a function of environmental factors such as peer pressure, opportunity, recent experiences, and the emotional state of the individual. If this is true, it lends further support to the idea of coordinating and unifying governmental efforts at all levels—local, State, and Federal. For this possibility to become a reality, it may be necessary to establish a formal organization such as an Institute for the Prevention of Social Problems, or perhaps adequate programing could be achieved through a Central Coordinating Office for Prevention. It is, however, unlikely that significant coordination will emerge on a voluntary basis.

FIGURE 2.–*Combined prevention effort of four Federal agencies*



In any form of unification it also would be necessary and desirable to maintain formal liaison with the original social-problem agencies. Such linkages would benefit the new program as a result of the agency expertise and would assure the primary agencies that their various concerns were receiving proper attention. Some form of coordination is essential if the meager primary prevention resources are to be expended effectively.

The discussion to this point has suggested the following assumptions:

1. A reasonable goal for drug-abuse prevention should be to educate for responsible decisionmaking regarding the use of all drugs (licit and illicit) for all ages.

2. Responsible decisions regarding personal use of drugs should result in fewer negative consequences for the individual.

3. The most effective approach to achieve the above goals would be a program that increases self-esteem, interpersonal skills, and participation in alternatives.

4. It appears that a large number of local, State, and Federal agencies have similar goals and assumptions for other forms of social-problem behavior.

5. There should be a unified Government effort which would result in the mutual funding of the development, implementation, and evaluation of a multidimensional prevention effort.

PROGRAM ELEMENTS

These position statements could be refined or elaborated, but for purposes of this chapter they are presented as trends, even though any one of them may not be totally valid. As a total position, they do represent the dominant objectives and assumptions in the field today. The question arises then as to the critical program elements and activities that would accomplish these goals and reflect the mutual concerns of various prevention offices.

There have been several reviews of research that have focused on the outcomes of different programs (Pyramid 1976; Goodstadt 1974; Swisher and Hoffman 1975; Dorn and Thompson 1976; Braucht et al. 1973; and Richards 1969). The general conclusions of these reviews suggested the following:

1. Very few programs have demonstrated clear success.

2. Very few programs incorporated adequate evaluation designs.

3. The relationship among information about drugs, attitudes toward use, and actual use of drugs is unclear.

In the face of these conclusions, it is difficult to propose program elements that will accomplish any objective. Nonetheless, this section will attempt to identify elements within those few programs that were successful. The intent of this discussion is to stimulate evaluations of some of these elements.

Primary prevention programs are more likely to be successful if they result from the combined efforts of schools, families, and community projects. The literature does not reveal evaluations of programs that have attempted to incorporate all three dimensions simultaneously. There are, however, several studies that have had some degree of success within a single situation. For example, Carney (1972) evaluated a program in Tempe, Arizona, and found that a fairly comprehensive school program could positively influence willingness to take risks (e.g., drug abuse). Geomet (1975) evaluated a program of special services for high-risk populations in New York City and found fewer drug referrals as a result of contact with concerned counselors and peers. Swisher and Piniuk (1973) evaluated a values-clarification approach to health education and found that information combined with this effective education strategy actually reduced drug use among high school students.

In the realm of families, there has been far less evaluation, but a few studies have indicated (Streit 1973; D'Augelli and Weener[3]; Blum 1972; and Schuchard[4]) that improved interpersonal communication between parents and their children, deliberate structure limits (curfews), and supervision of activities, as well as relevant information about the effects of drugs on growing children and adolescents, will result in fewer problems with drug use. In the community domain, a Pyramid (1976) review of studies revealed very few with any degree of success. One of the major limitations of each of these studies was that they typically occurred in isolation from other important aspects of the individual's life. While it is possible to have some small success in one domain, the potential for success would be greatly increased if a total program were initiated and evaluated.

Primary prevention programs are more likely to be successful if they combine personal and social growth (affective education) with drug information. Evaluations of programs that emphasized information have indicated that increased knowledge among participants has no impact on an individual's use of drugs or intentions to use in the future (Swisher and Hoffman 1975; Pyramid 1976). Only one evaluation has revealed negative results from an information program (Stuart 1974) but these results have received excessive attention in the mass media. There are, however, two studies that specifically combined cognitive and affective elements and produced positive results (Carney 1972, Swisher et al. 1973). Furthermore, the Pyramid review (1976) also concluded that a combination of cognitive and affective materials is more successful in terms of drug-abuse prevention. While the relationships among information, attitudes, and use are equivocal (Dorn and Thompson 1976) a combination of increased knowledge about drugs and more satisfactory affect is at least a worthy hypothesis to evaluate.

Programs that are integrated into the ongoing activities of schools, families, and community organizations are more likely to be successful than programs that are simply additions in any setting. One of the major problems facing prevention professionals is how to convince schools, families, and community groups that they have time for a prevention program. This has been a longstanding concern in affective education and the most plausible solution appears to involve integrating prevention themes, content, and activities into the existing or traditional activities of the three settings (Rubin 1973; Vicary 1977a; Kirschenbaum 1977). Attempts at special projects, courses, or family activities have had only short-term acceptance and are eventually pushed aside for other more current fads. If a program is integrated into the current activities, it is more likely to have a longer life and thereby accomplish its purpose.

Programs that synthesize and extract the basic themes from various prepackaged materials and integrate them into existing programs are more likely to be successful. The drug abuse prevention field has been flooded with one fad after another, each one elaborately packaged and promoted as an effective tool. The situation reached a peak approximately 5 years ago when the Federal Government imposed a moratorium on the production of federally sponsored material. Furthermore, if one were to factor out the essential ingredients of an effective program, it would not be necessary to engage in additional training every time a new package became available, nor would it be necessary to purchase all of the materials in the market.

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[3] J. D'Augelli and J. Weener. "Development of a parent education program as a drug abuse prevention strategy." Final report to Governor's Council on Drug and Alcohol Abuse, June 1975.

[4] K. Schuchard 1977 personal communication to Drs. DuPont and Petersen.

In order to synthesize the basic themes evident in existing packages it will be necessary to fund sophisticated research and theory building for exactly that purpose. Such a project would constantly examine and evaluate existing and new prevention packages (e.g., magic circle, parent effectiveness training, values clarification).

IMPLICATIONS FOR TRAINING

In order to implement programs consistent with the elements listed above, extensive training and/or retraining will be necessary. The early training efforts of the Federal Government were concerned with making a variety of people aware of the growing problem of drug abuse. Very few of the programs were designed to give individual skills they could use to implement programs (Shute and Swisher 1974). The National Institute on Drug Abuse has given a low priority to prevention training but the Office of Education, with very limited resources, through the leadership of Dr. Helen Nowlis, has developed a successful system of training community teams.

Each community sends a team to one of several regional centers for 2 weeks. During that time, teams are given background material and assisted with the development of a plan that is adapted to their community. A followup study indicated that the teams have raised $3.7 million and provide programs to approximately 1 million individuals each year.

The program elements outlined above would suggest an even greater effort, perhaps aimed at producing trainers who would work in the community with a team as it attempts to implement and expand program efforts. Research from teacher education has concluded it is important for teachers to have an opportunity to implement recently acquired skills in real situations (Peck and Tucker 1973). Similarly, parent training and courses for community agency personnel are more likely to be successful if they have an opportunity to practice new skills in real situations. This need for an opportunity to try out skills in reality lends support to the idea of community-based trainers who could be directly involved and immediately available. Each community-based trainer could be expected to:

1. Coordinate simultaneous training of teachers, parents, and community agency personnel.

2. Develop ideas for integrating cognitive and affective learning.

3. Assist teachers, parents, and community agency personnel with integrating prevention activities into their regular activities of classrooms, families, and agencies.

4. Synthesize basic themes from new modalities and translate these into appropriate training activities.

This expanded network of trainers could be updated readily through additional training of their own and they could be equipped to assist with a variety of evaluation efforts. A community-based trainer also could assist with educating the entire community as to the goals and procedures for effective prevention programs.

IMPLICATIONS FOR RESEARCH AND EVALUATION

The need for evaluation in substance abuse prevention has been recognized since the late sixties, but relatively little has been done to respond to this need. Fewer than 30 studies have been conducted and identified during the last decade and most of these were without the benefit of the results of the other studies.

Several Government agencies, most notably the Office of Education and the National Institute on Drug Abuse, have been publicly advocating that evaluation be a part of every prevention program. However, these agencies have funded less than 20 percent of the studies known. Of the ones funded by these agencies, the results have not been widely circulated or published in the professional literature. More specifically, of the 20 studies available to be reviewed by Dorn (1975), none had been funded by OE or NIDA. The first guidelines for evaluation (Abrams et al. 1973) were sponsored by the Drug Abuse Council—a privately supported agency.

It is likely that this paucity of effort and lack of leadership initiative will be corrected by NIDA, in that the Prevention Branch has recently adopted a set of policies that give a high priority to evaluation. These policies in the form of grant application review criteria indicate that the Prevention Branch is interested in and will give priority to projects that develop evaluation technology or conduct evaluations of a promising model program.

Primary prevention personnel have accepted a greater burden for evaluating their services than have other professionals in the drug field, including treatment personnel and law enforcement personnel. It appears that prevention professionals are expected to meet higher standards of accountability than their colleagues in other parts of the drug field. Specifically, evaluation of the effectiveness of treatment has rarely met any criteria of scientific objectivity, such as random assignment of subjects to experimental programs, comparison of more than one experimental condition, deployment of control groups, use of longitudinal designs, reliable and valid measures, etc. In spite of these methodological failures, as well as widely recognized recidivism rates, treatment programs continue to receive extensive funding. On the other hand, many prevention projects are faulted for their lack of scientific objectivity and inability to produce results. These reasons are frequently used as a justification for reduced funding.

Drug education programs are also expected to meet higher standards of accountability than almost any other school or community agency program. For example, social studies courses in the schools have not produced a high percentage of voting citizens. Only half the eligible voters register and only half of those individuals engage in regular voting behavior. One might conclude that the entire social studies curriculum is a failure unless a 25 percent success rate with voting behavior is acceptable.

One purpose of evaluation is to help a staff improve and succeed with their clientele. Many of the fears of evaluation could be overcome if this purpose were recognized and appropriate actions consistent with the purpose were taken. Evaluators are typically trained in academic circles where it is practically impossible to arrive at a conclusion without going through very meticulous research procedures. These same procedures frequently do not work well in real schools or community agencies where, for example, randomization is not possible and control groups must be deprived of a potentially beneficial exposure in order to conduct an "adequate" evaluation. Many evaluators arrive on the scene with a set of absolutes which are immediately resisted by program staff, and the inevitable conflict is underway. Blum (1973) noted that evaluations almost always caused staff conflicts. Central to these conflicts is the presumption by evaluators, program staff, and funding agencies that the results of an evaluation will give a clear indication of the worth of the program. If proven effective, the notion is that the program will be expanded (which has never happened) or, if proven ineffective, the program will be discontinued (which has happened).

An issue related to the central purpose of evaluation involves the differences between "basic research" and "applied research." An important difference between basic and applied research is that in an evaluation (applied research) the data and their implications are or should be used for program improvements on a continuing basis. For example, if the data in the first 6 months suggest that a change should be made in the program, then the program and the evaluation should be changed. Hawks (1973), in a list of evaluation issues, indicated an awareness of the need for flexibility when he argued:

> A third response is to exaggerate the methodological problems involved, examples of which would be the insistence that everything be held constant except the designated communication or that the groups compared be exactly equivalent.

The justification for this position is in terms of the purpose of evaluation—to help a program succeed and ultimately to improve its services to clients. Our example of the necessity for this flexible approach actually occurred in an evaluation drug education program (Carney 1972). It was discovered that the students in the experimental program (a cognitive information dissemination process) had increased their levels of drug abuse. The staff decided to alter the program to incorporate affective dimensions. The second- and third-year data from the evaluation revealed that the levels of drug use began to decline and it was determined that the decline was statistically significant. It would have been inhumane not to alter the program, and important data would have been lost if the evaluation design were not changed but allowed to continue. Only the most rigid and detached social scientists would condone continuing a program with demonstrated harmful effects. It behooves funding agencies to avoid this type of potentially dangerous scientific rigidity. Evaluation grants should be required to build in "fail-safe" procedures if for no other reason than to protect the clients from harm.

Even though only approximately 30 evaluations exist in the field, potentially there are many studies from related fields that need to be utilized in the development of new evaluation efforts. These related fields include: (1) prevention efforts in the areas of delinquency, sex education, mental health, nutrition, etc., and (2) basic learning and developmental research from the social sciences.

First of all, it is important for the federally sponsored institutes to summarize and disseminate what is presently known about program effectiveness. In the area of other prevention studies (e.g., delinquency), there is a need to identify relevant and related efforts and summarize the implications for the benefit of current program personnel. A useful first effort for a coordinated interagency governmental project would be the compilation of studies, the results of which would probably benefit all the agencies involved. The Prevention Branch's annotated guide to selected literature (1977) is a good example of the type of activity that will be helpful to the field.

Beyond a cooperative venture in related areas there is need to draw upon the existing knowledge from the basic social sciences and education. These fields have been concerned since their origins with attempting to understand how people learn and change. An awareness of basic research in the social sciences can save a great deal of effort and time. For example, 2 years were spent developing and field testing a decisionmaking program with fourth, fifth, and sixth grade children (Evans et al. 1976). The evaluation indicated that the materials were effective with fifth and sixth graders but not with fourth graders. One of the conclusions was that the steps in the process required a higher level of abstract reasoning than the fourth graders were capable of. In this instance, an awareness of Piaget (1969) made it possible to understand the results and redirect future efforts. Similarly, an awareness of classroom climate factors ranging from room arrangement to the verbal and nonverbal interaction between teachers and students could also enhance the training efforts in the field (e.g., Withall 1969; Johnson and Johnson 1975). The purpose here is to be not all inclusive, but rather to suggest that primary prevention efforts could benefit signficantly by drawing upon a variety of disciplines that have been concerned with human behavior for over 100 years.

In addition to examining the implications of existing knowledge in the social sciences, it will be important to fund basic research and theory building in related fields. The need to synthesize basic principles from existing modalities is an example of this type of research. Furthermore, there is a need for more basic research into the process of how communities and their social institutions change in response to social problems. Such knowledge will be extremely important if the goals and procedures for drug abuse prevention shift in the direction of fostering responsible decisionmaking.

The diagrams that were presented as the basis for funding and unified effort can also be used to illustrate another evaluation problem—one which may account for the fact that many evaluations have produced minimal or no results. The typical contemporary approach to prevention has been to attempt to enhance one or more core skills, such as self-concepts, values clarification, assertiveness, etc. The impact measures frequently examine the individual's growth in the affective realms and possibly drug-use patterns. However, if enriched development is a prerequisite to a reduction in several social problems, then it would be appropriate to assess several problem areas simultaneously and to summate these scores into a single index. For example, if there were a project jointly funded by LEAA for purposes of delinquency prevention and NIDA for drug abuse prevention, then it would be appropriate to develop a measure of delinquent behaviors and a measure of drug behaviors, the scores for each of which could be added together to arrive at a larger index of social problem prevention.

In one study primarily concerned with drugs (narrowly defined, e.g., marihuana, hallucinogens, heroin, etc.), a scale for tobacco and alcohol was included. None of the three—drugs, tobacco, or alcohol measures—was significant, but when combined they produced significant differences (Swisher et al. 1973). All of the scales mentioned above involved substances, but the program focused on interpersonal skills and a narrow range of drugs. However, the impact generalized to other substances, and it is hypothesized that if other social problem areas were encompassed the results are likely to be even more significant.

There are two basic reasons for this hypothesis. First, the core of enriched development is theoretically a prerequisite to preventing a broad range of social problems. The current philosophies and programs of a broad range of social problem agencies lend credence to this position. Secondly, the potential increase in scores allows greater statistical variability in the data being summated. In essence, the more behavior sampled in an instrument, the greater will be the variation in scores and, therefore, more likelihood of detecting any changes and/or differences in those scores. Any specific behavior (e.g., drug consumption) may be infrequent for most of the age groups targeted by prevention programs. Consequently, any means of assessing a broader range of behaviors should facilitate assessment of impact.

Another basic problem in evaluation of prevention programs has been that they have attempted to prove they have prevented a behavior that was not present at the time they first began. One solution to this dilemma rests with a knowledge of a typical drug-use developmental profile. If one extrapolates drug-use patterns for various ages there is a general increase in use of drugs from ages 9 to 18. Figure 3 presents a diagram of drug use over time based on several different studies (Blum 1976, Swisher and Piniuk 1973, Hughes et al. 1972).

Each of these references used different data-gathering techniques. However, regardless of these variations in data collection and reporting, the general trend appears consistent. These three independent sources have yielded similar drug-use profiles over time. An operational definition of prevention could, therefore, be a change from the typical pattern in a more moderate direction. Figure 4 is a hypothetical example of such a pattern.

Distance A equals the amount of abuse prevention accomplished by the hypothetical program. The drug-use level for the experimental group represents a likelihood of fewer crises and fewer dependencies (addictions).

To arrive at this type of finding, programs will need to be funded for 3 to 5 years at a minimum. Dorn and Thompson (1976) also recognized the importance of longitudinal evaluation in order to assess impact accurately.

SUMMARY

This review of issues in primary prevention has attempted to identify significant trends and to posit a reasonable stand regarding several of the issues.

FIGURE 3.–*Typical patterns of drug use by age (extrapolated)*

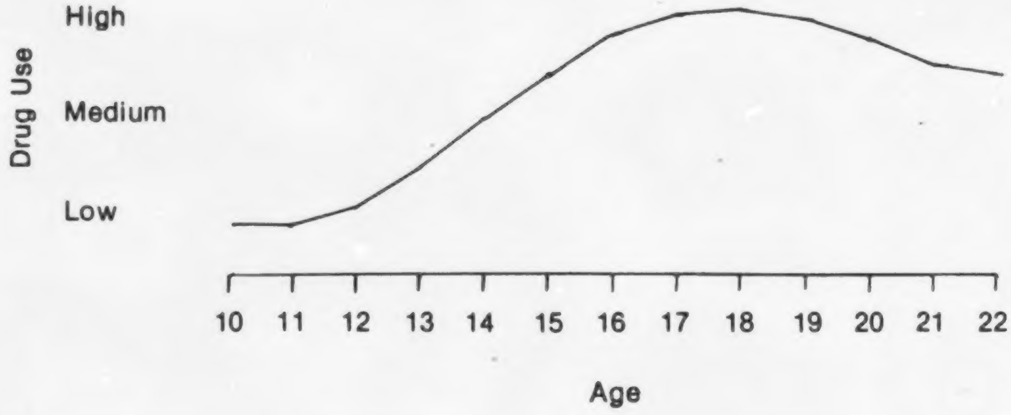
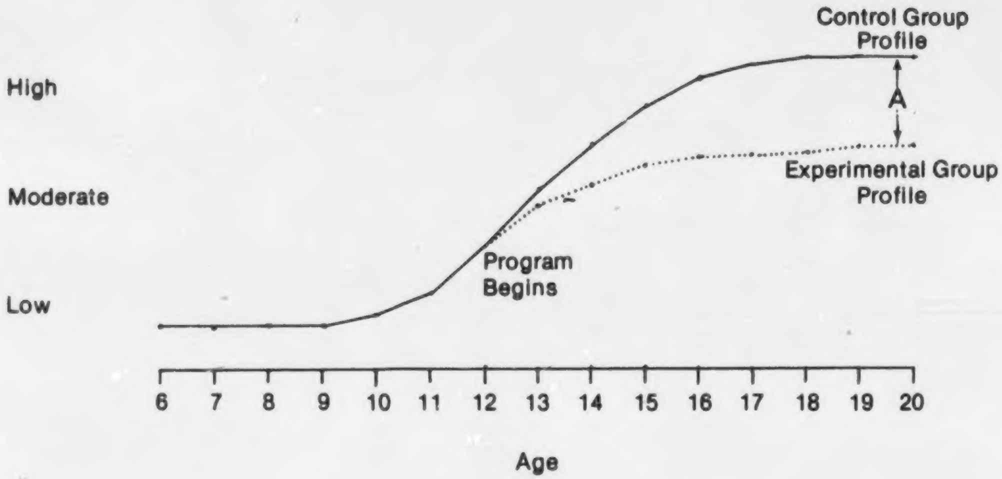


FIGURE 4



For the next 10 years it is recommended that prevention resources now located in as many as 60 different Government agencies be combined in a more effective fashion. These agencies should differentiate among primary, secondary, and tertiary prevention. Secondary prevention (intervention) should receive separate funding, which should more adequately respond to the needs of high-risk minority groups. Primary prevention activities occurring before the fact of abuse should attempt to prevent only that use of drugs that may have harmful consequences for the individual and society. Total abstinence for some may be an appropriate outcome, but given the current levels of drug use in the United States, it is more important to foster prevention activities that prevent negative consequences rather than those that attempt, unrealistically, to prevent any use of drugs.

While there is relatively little evidence to base a prevention program on, it is important to use the existing data to implement and carefully evaluate the most promising ideas. As a data base accrues, it may become possible to be more definitive about to what extent something affects someone. Some important hypotheses to evaluate include: (1) Primary prevention programs that combine school, family, and communities are more likely to be successful. (2) Prevention programs that combine information about use while enhancing the personal and social growth of individuals are more likely to succeed. Evaluators should assist with the refinement of programs and should incorporate several combined indicators of changes in social problem behavior. To be effective, primary prevention must carefully coordinate the use of resources within the Government and the community, draw upon the perspectives of several disciplines, and use a range of promising techniques, and prevention programs must monitor themselves in order to develop accountability and a knowledge base of what type of programs can have demonstrated results.

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drug treatment in the future

We began with an overview of the past, a review of how we arrived at where we are today. The intervening chapters have summarized much of our current knowledge and thinking in a form that, hopefully, will be useful to all who are actively engaged in the drug abuse area. In this final section, we look into the future with Goldstein on research prospects and DuPont more on policy and extrapolation of current trends.

41. Recent Advances in Basic Research Relevant to Drug Abuse

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INTRODUCTION

Drug abuse is a complex phenomenon, with important psychologic and sociologic aspects. The neuropsychopharmacologist perceives as a common element the compulsive self-administration of a drug. This implies that a fundamental aspect of drug abuse is neurochemical. All drugs of abuse produce neurochemical changes. All are, in themselves, positively reinforcing, as evidenced by the fact that they are self-administered by animals. Indeed, the common drugs of abuse are all, under appropriate conditions, self-administered by experimental animals, whereas drugs of other classes are not. Essentially all animals of a species engage in this behavior, indicating that positive reinforcement is a widespread and basic biologic property of such drugs. Thus, we regard the neurochemical aspects as central to the phenomenon, with psychologic and sociologic factors playing a modulatory role. The task of basic research is to clarify the neurochemical effects of the drugs of abuse, and their interactions with innate and environmentally conditioned factors.

The social value of basic research on drug abuse lies not only in the gaining of knowledge for its own sake, but in the certainty that deeper understanding will lead to improved prevention and treatment. "Certainty" may seem a strong word to the nonscientist reader, but it is justified by the whole history of biomedical research. A good analogy is in the history of poliomyelitis. Only 30 years ago, enormous expenditures were required for physical rehabilitation of the many victims of this paralytic disease. Treatment yielded amelioration, but there was no cure of the disease or its devastating aftermath. Prevention was impossible, and treatment discouraging, with long-term outcomes unimpressive, as are the outcomes of drug abuse treatment today. But basic research on the growth of kidney cells in culture—not even consciously directed toward the polio problem—led to the possibility of vaccine production. The cost of that basic research was trivial compared with its ultimate benefits—the virtual elimination of the disease. Similar history could be cited for numerous diseases, in which some advance in fundamental understanding led to a radical change in our ability to prevent or treat.

In this chapter I shall select for discussion some recent research advances relating to four drugs of abuse—opiates, alcohol, nicotine, and benzodiazepines. The disproportionate space devoted to the endogenous opiate-like peptides (endorphins) reflects the tremendous research effort and world-wide excitement about this new field. The remaining three examples, discussed much more briefly, should give the reader some understanding of important directions being taken in the research laboratories. Selected references are listed at the end of the chapter.

ENDORPHINS: ENDOGENOUS OPIOID PEPTIDES

History of the Endorphins

The pharmacologic actions of morphine and related opiates are extremely complex. These substances are the most effective pain killers known to medicine, they alter emotional responses to pain and stress in a remarkable fashion, they cause somnolence and tranquil sedation and sleep, they depress the breathing (and thus kill in overdosage), they cause constipation, and so on.

Research of the past 50 years, and especially in the 1960s and early 1970s, demonstrated the high degree of specificity of opiate action. By studying the effects of many hundreds of chemically related molecules, scientists learned exactly what features of molecular architecture were required to produce the characteristic opiate actions most effectively. It became evident that there must be highly specific receptors on nerve cells in particular locations of the nervous system. These receptors would be fashioned, like locks, to accept only the key-shape of an opiate molecule. By 1973 the opiate receptors had been demonstrated in a very tangible, physical way—by the binding of radioactive opiates. The receptors are on membranes of nerve cells—but only on nerve cells. They proved to be localized in various structures of the brain and spinal cord, highly concentrated in some places, virtually absent in others. Also, opiate receptors were found in all vertebrates but not in invertebrates, indicating they were an adaptive advance by nature at a fairly high stage of evolution.

The distribution of opiate receptors in the brain resembles, in a general way, the distribution of a neurotransmitter. Norepinephrine, for example, is packaged in granules of certain nerve endings. Its overall distribution in the brain is patchy, with small regions of high concentration and other regions with none detectable at all. Norepinephrine receptors are distributed to correspond with the norepinephrine in nerve endings, for a neurotransmitter, when it is released, has to combine with its specific receptor in order to cause its typical biologic effect.

The unusually high structural specificity of the opiates and of the opiate receptors, the distribution of the receptors suggesting they might be neurotransmitter receptors, and the evolutionary evidence raised the following question. Was it really conceivable that opiate receptors were meant to accommodate the morphine molecule, which in nature is found only in the opium poppy? Was it not more likely that there was a natural substance, a morphine-like neurotransmitter, and that the accident of nature was to produce a similar-shaped molecule in a plant. Thus, the search for an "endogenous ligand" of the opiate receptor got underway ("ligand" means a molecule that binds to a receptor).

In 1975, after a deliberate search, two substances were discovered in pig brains, which have the pharmacologic actions of morphine, heroin, and related opiates. These were small peptides, consisting of a chain of five amino acids. The more abundant one had the sequence tyrosine-glycine-glycine-phenylalanine-methionine; it was called methionine-enkephalin. The other was very similar, differing only in that the amino acid leucine was present in the fifth position instead of methionine. It was called leucine-enkephalin.

Shortly thereafter, much longer peptides were discovered in the pituitary gland. One was identified as a 31-amino-acid peptide and was called beta-endorphin. The first five amino acids of this peptide were identical to methionine-enkephalin.

These are not the only morphine-like peptides, but the chemical structures of the others have not yet been identified. For example, there is another peptide in the pituitary gland. And there is also a small nonpeptide in the brain, very much like morphine in its chemical properties.

The term endorphin is used in a generic sense to mean any morphine-like peptide. The specific term beta-endorphin refers to the long pituitary peptide noted above. The term enkephalin refers to the small brain peptides, both methionine-enkephalin and leucine-enkephalin.

Distribution of Endorphins

In the few years since their discovery, many researchers have been attracted into endorphin research, and rapid progress has been made. It is now known that the enkephalins are present only in the brain and spinal cord, and in the intrinsic nerve networks of the intestine. They are contained in short neurons, and there they are in the nerve terminals, in the manner of neurotransmitters. This means they can be released by nerve activity, to act upon the opiate receptors that are located on other nerve cells.

Enkephalin-containing neurons and opiate receptors are deployed together throughout the nervous system. They are clustered along the pain pathways, starting in the regions of the spinal cord, where nerve cells carrying pain information enter. Thus, release of enkephalin in the spinal cord can shut down pain messages before they ascend to the brain. Enkephalin neurons are also found in many other areas of the nervous system, in regions known to be involved in motor function, mood control, emotions, hormone release, memory storage, etc. The enkephalin neurons are characteristically short; they are known as interneurons, meaning they act as a short communication link between other nerve cells in a localized region.

Beta-endorphin is found in very high concentration in the pituitary gland, in the anterior and intermediate lobes of that gland (humans, however, do not have an intermediate lobe). The same cells that contain beta-endorphin also contain ACTH, the well-known pituitary hormone that is activated by stress, and that stimulates production and release of adrenal steroids (especially cortisol) by the adrenal cortex. Not only are beta-endorphin and ACTH present in the same cells, and in the same granules within the cells, they are actually made together on the same larger precursor molecule. This is a very long peptide that contains both ACTH and beta-endorphin. They are therefore probably released together, but some believe there are separate secretion mechanisms.

Matters are actually more complicated. The beta-endorphin is not made as an independent unit but is itself contained within a still longer peptide, called beta-lipotropin. Thus, the very large precursor actually contains ACTH and beta-lipotropin (91 amino acids). Beta-lipotropin, in turn, contains beta-endorphin (31 amino acids). As noted above, beta-endorphin contains (as its first five amino acids) methionine-enkephalin. However, it has not yet been ascertained if the methionine-enkephalin in the brain actually is derived from beta-endorphin, and some doubt is cast by the fact that the enkephalin neurons do not contain any trace of beta-endorphin. So it is still a mystery where methionine-enkephalin comes from. It is an even greater mystery where leucine-enkephalin comes from, since no longer peptide containing it has yet been conclusively identified.

In addition to the beta-lipotropin (containing beta-endorphin) in the pituitary gland, there is also a system of neurons in the brain, which contain beta-lipotropin and ACTH. The system of beta-lipotropin/beta-endorphin/ACTH neurons is nothing like the enkephalin system. These nerve cells are found in a single cluster in the hypothalamus, from where their long processes spread widely throughout many parts of the brain. These neurons do not contain any enkephalin. Thus, there are two entirely independent neuronal systems in the brain, both containing morphine-like peptides. Presumably, they have somewhat different functions, but we do not yet know what those functions are.

The enkephalins are destroyed extremely rapidly in brain tissue. This is typical of many neurotransmitters, which are released, and act quickly, and are broken down quickly, so that the receptors can then respond to a new burst of neurotransmitter release. Thus, the enkephalins have the properties we expect of neurotransmitters.

Beta-endorphin, in contrast, is very stable. Its effects are long-lasting, in the manner of hormones, which circulate in the blood or the cerebrospinal fluid.

It appears, then, that one system of morphine-like peptides is suited for rapid on-off actions, whereas the other brings about long-sustained modifications of nervous-system function.

Endorphin Function

The actions of the endorphins at the opiate receptors are pretty well understood. They are inhibitors of nerve activity. They diminish the release of other neurotransmitters. For example, suppose a nerve cell uses acetylcholine as its transmitter, thus activating another neuron. Now if this acetylcholine-containing nerve cell has opiate receptors, and if enkephalin is released nearby, the release of acetylcholine will be decreased. Thus, the function of the nerve cell upon which the acetylcholine acts will be depressed. If a nerve cell uses dopamine as its transmitter, and if it contains opiate receptors, then release of enkephalin nearby will diminish the dopamine release. It is this universality of inhibitory effect caused by agonists of the opiate receptors that accounts for the evident complexity of the actions of morphine-like peptides, comparable to the complexity of the actions of morphine itself.

Knowing that endorphins can decrease the release of various neurotransmitters from neurons does not really tell us much about function. What we want to know is what kinds of circumstance turn the release of endorphins on or off, and where this occurs in the brain or spinal cord, and what physical or behavioral changes happen in the body as a result. Such information is difficult to come by, because we still do not know how to measure the local release of any neurotransmitter in a given region of the central nervous system of a living animal.

The approach used most frequently to date has been an indirect one. Naloxone (Narcan) is a highly specific opiate antagonist. It occupies the opiate receptors, yet does not activate them. In this way it prevents opiates like heroin or morphine from combining with the receptors. For example, naloxone is used to treat victims of heroin overdosage; it resuscitates them dramatically, by displacing heroin and morphine from the receptors. Naltrexone, a long-lasting analogue of naloxone, is used in preventing relapse of abstinent heroin addicts; as long as it is in the system, occupying the receptors, heroin can have no effect. By blocking the receptors with naloxone or naltrexone, we can also prevent endorphin actions. Then, any change brought about by these antagonists in normal animals or humans will be an indication of what the endorphins were doing.

The most obvious place to look first was to the control of pain. If an endorphin mechanism were continuously fine-tuning our sensitivity to pain, by suppressing the pain impulses as they ascend the spinal pathways, naloxone should make people more sensitive to pain, and should intensify existing pain. Even if endorphins were not continuously active in regulating the pain threshold, pain itself might activate endorphin release, and thus bring about a tempering of the pain perception. Surprisingly, in experiments with humans in which experimental pain was inflicted, naloxone had no effect at all, either on the intensity of perceived pain, or on mood. Evidently, very severe and stressful pain may be required to activate the endorphin system.

On the other hand, there is clear evidence that certain kinds of artificial stimulation that cause pain relief may indeed work through release of endorphins. One example is stimulation-produced analgesia. An electric current passed into a certain part of the brain in the floor of the fourth ventricle causes profound analgesia, both in animals and in people. The technique has been used to alleviate intractable pain. Naloxone blocks the effect, abolishing the analgesia.

Another kind of artificial stimulation that seems to release endorphins is acupuncture. Both in animals and in humans, naloxone prevents acupuncture analgesia.

Certain hormonal actions appear to be regulated by endorphins. A good example is the release of luteinizing hormone (LH) from the pituitary gland into the blood. This is the hormone that acts on the ovaries in females and on the testes in males to cause production and release of the sex hormones. Morphine has long been known to suppress the release of LH from the pituitary gland and thus to cause a decrease in circulating testosterone (the male steroid sex hormone). Naloxone, of course, blocks this effect of morphine. It has now become clear that naloxone (or naltrexone), by itself, causes a large increase in LH output from the pituitary. We have to conclude that under normal circumstances a morphine-like effect of some endorphin is continuously holding back the release of LH. Thus, naloxone, by blocking this continuous inhibitory regulation by endorphin, allows LH to be poured out into the blood stream.

Two other pituitary hormones, growth hormone (GH) and prolactin (PRL) work in reverse. Morphine or endorphins stimulate their release. Naloxone inhibits their release.

It seems likely that endorphins play a role in the body's reaction to stress. The close relationship of beta-endorphin and ACTH has already been noted. Various kinds of stress, in animals and in humans, cause a release of ACTH from the pituitary gland, and a concomitant release of beta-endorphin. For example, if rats are subjected to very severe stress, even of a nonpainful kind, the beta-endorphin content of the pituitary is greatly reduced. This is accompanied by a large increase in circulating beta-endorphin in the blood, together with an increase in circulating ACTH. However, although we know the target organ upon which ACTH acts (the adrenal cortex), we have no idea where the blood-borne beta-endorphin acts. It seems very unlikely that so large a peptide gains access from the blood into the central nervous system. It is now thought more likely that the main secretion of pituitary beta-endorphin passes directly from the pituitary back into the brain, to act on the known opiate receptors there. According to this view, the appearance of beta-endorphin in the blood may be mere spill-over, without functional significance.

Under ordinary nonstressful conditions, circulating beta-endorphin is barely measurable. Several research groups have been trying to develop a good measurement technique, using radioimmunoassay. It appears that the amount in 1 ml of blood plasma is no more than about 50 picograms (a picogram is one millionth of one millionth of a gram, and a gram is approximately one-quarter of a teaspoonful). Studies of beta-endorphin in normal and abnormal conditions will require that the measurement technique be perfected. No enkephalins are found in blood because they are broken down so rapidly.

Possible Abnormalities of Endorphin Function

Most of the suggestions about endorphin deficiency or excess in various disease states are based on dubious evidence or are purely speculative. The greatest excitement has been produced by indications that endorphins may be deranged in mental illnesses such as schizophrenia or manic-depressive psychosis.

Early studies with a few hallucinating schizophrenics indicated that naloxone alleviated the hallucinations. These studies were not carried out with double-blind precautions or placebo controls. Only by using such techniques can we obtain reliable information about the efficacy of drugs in altering psychiatric states. The reason is that psychiatric disorders are prone to spontanous improvement and relapse, so that temporary changes may be caused by any, or no, therapeutic intervention at all. Only if an injection of placebo (salt solution) is ineffective, while the drug is effective, can we have confidence that a pharmacologic action is involved. Even then, because subjective bias can play a large role in such trials, we can only believe the result if neither the patient nor the experimenter is aware of whether placebo or drug is being administered. This is what is meant by double-blind design.

Subsequent studies by numerous research groups using placebo controls and double-blind design failed to confirm the claimed dramatic effect of naloxone on schizophrenic hallucinations. However, there are some indications that some patients under some conditions may be improved by naloxone, and thus, that at least in some instances, excessive endorphin activity might play a role in the disorder. Improvements have also been observed in the manic phase of manic-depressive psychosis. Much research will be needed to establish decisively what kinds of psychotic patients do respond favorably to blockade of the endorphin system. If opiate antagonists ever prove to be of more than trivial therapeutic value, the long-acting antagonist naltrexone, which is effective by mouth, would be the drug of choice.

An interesting report of a single case of congenital insensitivity to pain suggests excessive endorphin release. In this very rare condition, since pain is not perceived, serious injury ensues, from burns and other kinds of trauma. In the one patient studied, by double-blind procedures, salt solution injected intravenously had no effect upon the pain threshold, but naloxone caused a dramatic temporary return of pain perception.

It is naturally interesting to speculate upon a possible role of the endorphins in opiate addiction. A first and obvious basis for such speculation is that if a hormone is administered, the body tends to shut down production of that same hormone. For example, if large amounts of adrenal cortical steroids are administered, the regulatory mechanism senses that sufficient hormone is circulating, so it stops the release of pituitary ACTH, and consequently, the adrenal gland stops making adrenal steroids. This is a kind of prototype of an "addiction" process. If hormone administration suddenly ceases, a withdrawal syndrome ensues, due to adrenal insufficiency, for the production of adrenal steroids cannot resume quickly enough.

We can imagine a similar set of responses in the endorphin system. When the opiate receptors are repeatedly or continuously exposed to heroin (morphine), the natural production of endorphins might be shut down. Then the withdrawal syndrome could be due, in part at least, to an endorphin deficiency when the heroin is taken away. Conceivably, after years of such insult to the endorphin system, it might take a very long time for return of normal endorphin function. The long-lasting depression and other protracted abstinence phenomena could possibly reflect an endorphin deficiency.

Another basis for speculation about endorphin deficiency in opiate addiction rests upon the fact that genetic defects can occur in the production of peptides. Conceivably, such an inborn defect in endorphin production might predispose some individuals to become heroin addicts, whereas others might be able to try heroin without becoming addicted.

The speculative nature of these ideas must be stressed. There is at present no evidence whatsoever concerning endorphin abnormalities in heroin addicts. Facts to support or refute these hypotheses will have to come from actual measurements of endorphins in addicts and in normals.

ALCOHOL

The mechanism whereby alcohol causes intoxication and dependence, and the neuro-chemical basis of its positively reinforcing property remain unknown. Ethyl alcohol is a small molecule—one might say a nondescript small molecule. Its molecular structure lacks what we call "informational content." In contrast to a complex molecule like morphine, it lacks chemically reactive functional groups, and it lacks significant conformation (shape complexity). It has therefore been thought unlikely that there are specific alcohol receptors.

Alcohol is not unique in these respects. A large class of drugs shares the chemically inert character of alcohol. These are the general anesthetic agents, such as ether, halothane, and nitrous oxide (laughing gas). Moreover, all these drugs produce pharmacologic effects that are virtually indistinguishable from those of alcohol. Inhalation of ether and laughing gas, or glue sniffing have all had their day on the drug abuse scene, and all produce alcohol-like intoxication.

If there are no receptors for these agents, how might they act? In recent years much attention has been focused upon the fact that all such drugs dissolve readily in cell membranes. As long ago as the last century it was noted that the potency of such substances is inversely related to their solubility in oily liquids such as olive oil. The more soluble in such a lipid, the less is required to act upon the nervous system. Another way of putting this is to say that for all such substances, a certain critical concentration *in lipid* is sufficient for pharmacologic action. Since the membranes of all cells, including nerve cells, are lipid in composition, it was deduced that dissolving in the nerve cell membranes might be the sufficient condition for pharmacologic effect.

Recent technical advances in physical chemistry have opened the way to examine directly the effects of alcohol-like drugs upon cell membranes. The essential technique is known as *electron spin resonance*. In an appropriate instrument, the fluidity or rigidity of cell membranes can be studied. A measure known as the *order parameter* can be determined—a number from zero (completely fluid, without organized structure) to one (completely rigid and organized). The effects of drugs upon this order parameter give a quantitative estimate of the degree to which the organization of the membrane is disordered.

Alcohols and the volatile and gaseous anesthetics share the property of fluidizing and thus disorganizing cell membranes. Since numerous essential functions of nerve cells require the active participation of chemical processes in the membranes, it is supposed that fluidizing those membranes may disrupt these functions, and thus alter brain function as a whole.

A strong line of supporting evidence for this view comes from experiments on the reversal of anesthesia by high pressure. If small animals (e.g., tadpoles) are anesthetized with one of this class of drugs, then placed in a pressure chamber, they wake up. If the pressure is removed, they become anesthetized again. This dramatic effect can be attributed to the high pressure opposing the fluidizing effect on nerve cell membranes, as though the disordered membrane structure were forced back into its normal, more rigid state, despite the presence of the anesthetic molecules.

How do animals become tolerant to the effects of alcohol and dependent upon it? There is evidence now that after prolonged exposure to alcohol, when the drug no longer produces intoxication at a previously intoxicating dosage, the membranes have become resistant to the fluidizing effect. This probably comes about through a change in the chemical composition of the membranes, as might happen, for example, if they contained a higher proportion of saturated fatty acids or cholesterol.

Studies on the membrane effects of alcohol are proceeding very actively in several laboratories. The ultimate aim is to discover exactly how membrane fluidization alters the biochemical reactions that govern nerve cell function. Eventually, such research may yield the key to alcohol dependence and the alcohol withdrawal syndrome.

NICOTINE

Tobacco addiction is certainly the most destructive and socially costly of all the addictions, in terms of death and illness. Surprisingly, it has remained controversial whether or not tobacco addiction is really a pharmacologic addiction to nicotine. Nicotine is the most abundant alkaloidal drug in tobacco, but numerous conflicting theories abound concerning its role in smoking behavior. Could smoking be a mere "social custom," without any pharmacologic relevance? Could it be based primarily on a desire for oral gratification, for watching the smoke, for fingering a cigarette?

Would addicted smokers continue to smoke even if the cigarettes lacked nicotine entirely? Such an experiment is difficult to carry out, because removal of the nicotine greatly alters the taste of the cigarette. Several experiments with human subjects suggest that smokers do, indeed, tend to titrate themselves with nicotine. Thus, when nicotine is added to cigarettes without the subjects' knowledge, or administered intravenously while they are smoking, the number of cigarettes smoked decreases. Likewise, people tend to smoke more low-nicotine than high-nicotine cigarettes. But all such experiments performed to date are flawed in one or another technical aspect. For example, unless nicotine blood levels are measured during the experiment, we cannot be sure if a change in the number of cigarettes smoked really means that more or less nicotine is entering the system. The reason is that frequency and depth of puffing remains under the subject's control.

A major stumbling block to accepting that nicotine is the central factor in smoking behavior has been the inability to establish good self-administration behavior in animals. This was a real problem because, as noted earlier in this chapter, all other drugs of abuse are more or less readily self-administered by animals. One would not expect animals to learn actual smoking behavior, which has aversive features (e.g., bronchial irritation, unpleasant taste), but animals should certainly self-administer by the intravenous route.

Now this difficulty has finally been overcome. Rats have been shown to self-administer nicotine. It takes a while for this behavior to be established (probably earlier experimenters gave up too soon), but once established it persists. Indeed, a steadily increasing rate of self-administration is seen, with establishment of high levels of tolerance. This finding is an important breakthrough in nicotine research, which will certainly be exploited widely to gain a deeper understanding of the pharmacologic basis of tobacco addiction. The future should see the identification of nicotine receptors in the brain responsible for nicotine self-administration.

Another relatively new technique of value in nicotine research is called discriminative cueing. Rats can be trained to perform a certain task if they have received an injection of nicotine, an alternative task if they have received nothing or some ordinary salt solution. For example, in a T-maze, they can be trained to turn to the right to escape a shock when nicotine is in their systems, but to the left if no nicotine is present. Or they can be trained to press one lever to obtain food in the nicotine state, a different lever in the normal state. Now this technique can be used to investigate whether other drugs are "nicotine-like" (from the rat's viewpoint). It has already been discovered that very closely related analogues of nicotine are not perceived as nicotine by rats. The most striking example is that the stereoisomer (mirror-image) of nicotine, identical chemically but with an opposite shape, is not perceived as nicotine. This experiment shows that the receptors that mediate the discriminative cueing are highly specific—stereospecific, as are also, for example, the opiate receptors. The finding will provide the basis for physical identification of nicotine receptors by binding techniques, and their localization in the brain.

BENZODIAZEPINES

The benzodiazepines are a unique class of drugs with antianxiety properties, of which the best known example is diazepam (Valium). Pharmacologically, these drugs are very different from the barbiturates and other hypnotic-sedatives, although they have some superficial features in common. They are characterized by high potency in certain animal test procedures involving conflict, analogous to human anxiety. For example, if a hungry rat is trained to press a bar to receive a food reward and then also given a footshock at each bar-press, typical conflict behavior results. The animal attempts to press the bar, draws back, approaches, "freezes", and shows signs of great stress. Under the influence of a benzodiazepine the rat presses the bar for food, and accepts the footshocks without displaying signs of anxiety.

During the past year specific benzodiazepine receptors have been identified in the brain. These combine with all active benzodiazepines but not with drugs of other classes. Most important, the order of pharmacologic potency (as measured in conflict tests) in a series of benzodiazepines corresponds extremely well with the order of potency for binding to these receptor sites. None of the known neurotransmitters or neurohormones combines with them. The distribution of these receptors in the brain is very different from that of other known receptors, with high density in the cerebral cortex. As with opiate receptors, the benzodiazepine receptors are found in all the vertebrates, but not in lower forms of life, and they are found only in nervous tissue. The most exciting prospect based on these findings is that there might be a natural, endogenous, diazepam-like substance in the brain, which could act as a normal regulator of anxiety. The search for such a substance is on.

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432

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42. The Future of Drug Abuse Prevention

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After my colleagues have dealt in this book with the solid stuff of the past and the present, it is left for me to dream of the future. I begin with a disclaimer: My track record as a predictor of the future is well known and undistinguished. To cite just one example: I confidently predicted a downturn in national heroin trends in 1973, only to see the heroin problem increase in 1974 and again in 1975 (but the trends from 1976 to 1978 were indeed down). I urge the reader not to take my predictions more seriously than I do. They are one person's attempt to read the present state of affairs and guess about the future.

I have divided my speculations into two areas, Programs and Policies, and then added two issues of importance: a concern about the impact of drug abuse on personal freedom and a reflection on what science can and—equally important—cannot do.

PROGRAMS FOR THE FUTURE

The drug abuse field has grown up in the last decade around the drug abuse treatment clinic—a location where typically as few as 20 or as many as several hundred drug abusers gather on a regular basis to quit using illicit drugs with the help of a trained, paid staff. The unique role of this clinical core is easily seen in the fiscal year 1979 budget of the National Institute on Drug Abuse. Over 60 percent of the total of $275 million to be spent during that year will fund treatment for over 200,000 people in over 1,300 individual clinics located in all parts of the country. These clinics provide a wide variety of services to a varied client population. It is likely that categorical clinics will continue for the next decade to be the center of NIDA's funding. The categorical Government-funded programs are likely to focus increasingly on particular segments of the drug-using population: youth, the poor, women, and those people referred to treatment from the criminal justice system. These are the classically underserved in the health care system. But it also seems likely that more drug abusers will find services provided in more traditional caregiving institutions as the needs of these people and the treatments they can benefit from are increasingly accepted into the medical and social service mainstreams. A key test will be the coverage provided for drug abuse services under any proposal for national health insurance. While disappointments are certain in view of the long history of discrimination professionals and providers have established in dealing with drug abuse, it is inevitable, over the long run, that the achievement of stability and respectability which has characterized drug abuse treatment in the last decade will carry the drug abuser at least a little closer to the mainstream of health care during the next decade.

Similarly, it is hard not to predict the continued growth and development of the partnership between the States and the Federal Government which has been the single most important management-funding achievement in drug abuse treatment over the last decade. If this partnership is truly to flourish, it will be important to develop better techniques to meet the unique needs of the larger cities and the minority poor.

Is there nothing new on the treatment horizon? There are four general directions in which I expect to see new developments. The first, and perhaps the most important, will be the emergence of self-help as a key partner in providing services to drug abusers. The Alcoholics Anonymous model is too powerful, too effective, and too relevant not to spread to drug abuse. It is likely that most drug abuse programs of the future will make formal and informal alliances with self-help programs, and that increasing numbers of drug abusers in trouble will turn to self-help programs not only for "aftercare"—that is, posttreatment help—but also as the primary source of their care. Many AA chapters have already expanded their concern to include drug abusers. An organization was recently funded in New York called Potsmokers Anonymous. Narcotics Anonymous is already well established. Rather than seeing this trend in self-help as competition for the more traditional drug abuse treatment program, I see self-help as an essential partner in these efforts. This sense of partnership has certainly developed rapidly in the last decade in the alcoholism field.

The second new development will be the emergence of treatment programs (and self-help programs) for dependency on related "reenforcing substances" such as tobacco and alcohol but, I suspect, increasingly also for marihuana and prescription drugs. These treatment programs may even branch out to such related areas as weight control, exercise, and stress management.

The principles developed for the treatment of heroin addiction are generalizable to other dependencies, and I expect to see treatment programs and their clients make more use of these similarities in the future.

The third new area is related to the knot of issues raised by Betty Ford's courageous public admission of drug dependence and her use of treatment to deal with her problem. Nonopiate drug use, the misuse of prescription drugs, drug use by women, drug use by the non-poor, and finally drug use by the non-young are all part of this new development. Betty Ford punctured many of the stereotypes which had previously restricted the public view of drug abuse prevention and treatment to the problems of poor urban youth addicted to heroin. This new more comprehensive focus will encourage the facing of drug problems by drug-dependent individuals and their families who desperately need help. It will encourage the adoption of drug abuse programs by organizations and institutions which have traditionally dealt with the non-poor and the non-young. These range from mental health centers, to general hospitals, to private practitioners of medicine. The broad area will be a major growth area during the next decade. Although I expect most of this new growth to occur outside the drug abuse clinics, the process will also influence the client profile of these traditional clinics.

We can also expect a growing emphasis on the family as an integral part of both prevention and treatment efforts. It is unmistakable that drug use and quitting drug use are deeply imbedded in the network of human relationships of the drug user. For virtually everyone, that means the family in one of its many contemporary forms.

One more program change: There can be no doubt that the next decade will see the emergence of prevention as equal to treatment in terms of attention and support. It is unlikely that NIDA funding for prevention will ever equal that for treatment, but the overall social investment in drug abuse prevention will, I suspect, prove greater than that for treatment by the end of the next decade. We should have a better understanding of what works for whom, and we should finally find a way to conceptualize prevention programs on a communitywide basis. The recent emphasis on the basic modalities of prevention (information, education, alternatives, and early intervention) together with the emphasis on evaluation point the way to a brighter future for drug abuse prevention. The increased emphasis on prevention in health will also give a boost to drug abuse prevention.

In my overview of likely future program developments, I have not dealt with the major unknown: the possibility of entirely new techniques for both prevention and treatment. Surely we will at last have long-acting methadone and a nontoxic narcotic antagonist to add to our pharmacologic armamentarium before the end of the 1980s. The recent breakthroughs in understanding the body's own opiatelike substances offer hope that we may, before the next decade is over, have specific new tools. For example, we may be able to determine in advance who is susceptible to opiate and other drug dependence and who is not. We now know that some people can drink alcohol without being alcoholic and that many people use heroin once or twice and quit. (It is far less clear that any substantial number of people can use heroin regularly without addiction, although that previously unthinkable idea has received some support.) It may be that new research knowledge will permit precise determinations of vulnerability to drug dependence so that prevention and control measures can be better targeted. It is even possible that entirely new treatment techniques will be developed which will make our current techniques seem as old-fashioned as Sister Kenney's humane hot packs for polio victims now seem in the era of polio vaccine. However, a word of caution: The underlying problems we now label "drug abuse" have much to do with chemically reenforced behavior which is experienced by many as "pleasure." It seems highly unlikely that problems associated with people unwisely seeking pleasure will be eliminated in the next decade. We need not fear that our treatment and prevention programs with their humanistic techniques will become outdated. It is no more likely that even the most effective new treatment and prevention techniques will put today's preventors and treators out of business than polio vaccine put nurses out of business.

POLICIES FOR THE FUTURE

It is not yet assured, but it seems likely that the national commitment to dealing with drug abuse will remain steady and substantial. Thus, we can plan to build on the solid foundations of the last decade with much less worry that we may wake up one day to find that the whole effort has been "defunded."

Not only is it unlikely that the widespread public wish to "end the drug problem" will be realized, it is probable that at least for the next decade the overall levels of illicit drug use will continue to rise as they have over the last decade.

It is hard to imagine that the rates for the very young will continue to expand rapidly in the future, but the rates for those over 30 are likely to show substantial increases, particularly for marihuana and cocaine, today's hottest drugs.

A careful reading of the recent NIDA surveys shows clues to the future of our national drug policy. There is a growing and large consensus favoring a greater tolerance for adult occasional use of currently illicit drugs. There is, however, a large group who oppose public and regular use of any drug, including the legal drugs, alcohol and tobacco. There is also a growing awareness that a reasonable policy for drug use by adults (those over the unique intermediate age range of 16 to 21) is clearly different from a reasonable policy with respect to those under the age of 16. I anticipate a growing toughness about the use of all drugs (legal and illegal) in the under 16 age group—with schools, parents, and peers all joining in this effort. This change will result partly from the Nation's changing demography: The smaller number of youths and the larger number of young adults in the next decade will be in direct contrast to the youth explosion in the 1960s. This change will be associated with a reassertion of adult dominance and a general trend toward more conservative values. In addition, this increased toughness about "kiddy drug use" also reflects the growing awareness of the special dangers posed by regular use of any intoxicant in the fragile formative years of early adolescence.

Stepping back even farther, it seems that the potency of chemical reenforcers will have to be reckoned with as an increasingly serious health threat. The impact has not yet sunk in—the cost of letting each citizen set his own level of use of drugs such as alcohol and tobacco. The use of nonlegal sanctions against drug use of all kinds will surely increase. The social stigma increasingly being felt by the cigarette smoker will, I suspect, increasingly be felt by the user of other drugs, even—many will doubt my sanity here!—the user of alcohol during the next decade. Simply because these sanctions are not legal does not mean they are not potent. I expect many of them will prove to be less than generous or reasonable, as is increasingly the case with the strident antismoking crusaders.

The use of formal nonlegal sanctions can also be expected to increase. For example, when one now gets life or disability insurance, one must have a physical examination which typically includes a urine test to screen for diabetes and other diseases. It is already easy to test urine for metabolites of cigarette smoke, and it is not outside the current technology to also test for recent marihuana, alcohol, and other drug use. Those with this objective evidence of use of health-related substances may find themselves—like the overweight and the hypertensive—paying substantially higher premiums for their insurance. Drug users may also find their use aggressively restricted in public places, as is now the case with cigarette smokers. These trends grow out of the large majority of the public who do not use drugs and who take a dim view of those who do use drugs on a regular basis. I suspect these negative attitudes toward frequent or high-dose drug use will increase rather than decrease over the next decade. The same antidrug trend can be seen in the attitudes toward the use of prescription sleeping pills, diet drugs, and tranquilizers. Use trends and public support for use of these medications are clearly downtrends which I expect to see accelerate in the future.

It is entirely possible that the link between drug use and "pollution," "herbicides," "pesticides," etc., will become much closer. Much of the public will probably see the use of these chemicals as increasingly unhealthy for the user and nonuser alike. Of course, this trend may not be strong enough to offset the potent biology of reenforcement any more than the current emphasis on "natural nutrition" has reversed the trend to "convenience foods" for the majority of the public. However, the health food boom may soon show up in "convenience" health foods. This antipollution reasoning will influence large segments of the population, and it may well be that the drug abuse treatment and prevention programs of the future will focus increasingly on those individuals who for one or another reason are unable to heed the culturally insistent warnings about the dangers of chemical highs.

Overhanging drug abuse prevention policy in the Nation and throughout the world is the dark cloud of organized and unorganized crime—the vast sums of money now generated by illegal drug trafficking. The full implications of this "business" and the consideration of the options for dealing with it will prove to be one of the most puzzling aspects of the policy debate in the next decade. Simplistic solutions like "legalization" will increasingly be discussed. Once the public horror of even talking about such issues diminishes, the harsh realities will push us toward the complex mix of prohibition and regulatory controls we now use. If one were to promote legalization, what drugs would be "legalized" and for whom, at what price, and under what circumstances? Our dismal experience with the open commercial exploitation of each citizen's setting his own level of alcohol and tobacco use hardly serves as an optimistic precedent for the legalization scheme. The explosive growth of the drug paraphernalia industry (from marihuana wrapper papers, to drug-oriented magazines, to coke spoons) will offer an important battleground for many of these policy issues.

DRUG ABUSE AS A SOURCE OF EROSION OF PERSONAL FREEDOMS

Zealotry in drug abuse prevention poses real dangers. These dangers are now fairly obvious to many of us in terms of law enforcement, but they are less obvious in the treatment and prevention areas. For example, wiretapping, use of paid informers, unannounced breaking and entering by law enforcement agents, as well as many regulatory actions, pose fairly obvious risks. But how can drug abuse treatment pose a threat?

There is a paradox in all this which stands ready to take a bite out of our freedoms. For example, many reformers are now eager to divert marihuana and other drug users from the criminal justice system into treatment programs. Most of these marihuana users do not need or want treatment. Simply to move them from a prison to a hospital is to have achieved little social gain—especially if the hospital is equally depriving of individual liberties and more expensive! To sort your way through this one you must first think of what the goal of governmental action is.

With respect to the marihuana user, it seems to me reasonable for the Government to discourage the user and to provide him with information about the dangers of marihuana use, including the biological dangers, as well as the dangers of use of other drugs, the dangers of driving while intoxicated, and the impact of chronic intoxication on motivation and personal relationships. Such programs can also inform marihuana and other drug users about potentials for help with their habits should they desire such help. The State of Minnesota recently started such a program, funded primarily by the fines paid by the apprehended marihuana users. The Minnesota system requires attendance at a class on drug abuse, similar to the courses used in highway safety and alcoholism programs for people arrested for drunk driving. The marihuana user, in this approach, is not sent to prison, does not have an arrest record, does not use taxpayers' funds, and is provided with important and relevant information. He is also "punished" for his use of a prohibited substance by paying a reasonable fine, about $25. Some will, no doubt, argue that even this is an unwarranted intrusion on the marihuana user's liberties. The Minnesota program meets the test of moderation, and it helps sustain the reasonable point that society has decided that marihuana smoking is undesirable.

What about the heroin user? Despite the controversy over the point, the preponderance of evidence clearly shows that heroin use increases criminality. However, not all heroin users are criminals, and not all criminals are heroin users. It seems reasonable to have society set as a condition for release of heroin-addicted convicted criminals that they refrain from heroin use while they are on parole or probation—and enforce that condition by regular urine testing. But it does not seem reasonable to pick up heroin users who have not been found guilty of a crime and force them to take urine tests. And it does not seem reasonable to force the heroin-using parolee or probationer to enter treatment or, even worse, to enter a specific treatment program selected by the court or any other agent of the criminal justice system. The condition of refraining from heroin use on a regular basis is sufficient. If the parolee or probationer wants treatment to help him achieve that condition of his release, that is fine. If he can stop heroin use without treatment, so much the better.

These two brief examples hopefully suggest the range of areas in which drug abuse treatment poses threats to individual liberties and the need for balancing those threats with the needs of society. It is less important that you agree with where I draw the line than that you agree that the drawing of this line is of vital importance.

Few have thought through our generally laudable goals in the prevention field in terms of the potential threats to personal freedoms. The Government, the majority, want the minority of our population who choose to use illegal drugs to quit using them. Even more, the majority wants young people never to use illicit drugs. But where are the limits to efforts to prevent drug use? Who will be forced to do what? How will the problem people and the problem behaviors be identified? What limits will be placed on the techniques to be used? We want to promote healthy networks of concern in our communities. But how far are we prepared to go in mandating participation in these networks?

We are well served by making distinctions between youths and adults—being more forceful with the former and more permissive with the latter—and making distinctions between particular drugs and particular patterns of use, and most of all identifying dangerous behavior which warrants stiffer action. It is important to distinguish between "discouragement" and "elimination" in drug abuse prevention.

We must be prepared in the future to be much more open and realistic in our policy choices than we have been in the past. We must also be willing to live with the inevitable and often unpleasant complexities and contradictions that this openness will uncover.

These issues underlie many of our most familiar everyday problems. The boundaries are not easily defined. Drug abuse policy partakes of some of the most important and difficult areas of contemporary public policy.

SCIENCE GOOD AND SCIENCE BAD

We as a Nation have come out of a period which extended from the 1920s into the mid-1960s when our national drug abuse policy was set with little regard for the lack of scientific knowledge on which it was based. The policy was based on emotional and often ill-founded prejudices about who used drugs and what their effects were. (Parenthetically, most of the rest of the world is still back in this pre-1965 era in terms of their drug abuse policies.)

More recently, we have gone through a decade of profound reaction to this ill-informed early period. Many Americans, especially the most sophisticated, have concluded that we must turn drug abuse policy issues over to the scientists to avoid ever again repeating the errors of earlier decades. These well-intentioned people make two fundamental errors. They overestimate what science can tell them and they underestimate the vital importance of cultural forces in shaping behavior. With respect to the former point, science can tell us that tobacco increases the risk of lung cancer and heart attack. It can even estimate that tobacco use costs our society $18 billion a year. Science can tell us that the economic benefit from the cultivation of tobacco through the manufacture and sale of cigarettes is something like $12 billion. It can measure the highly ambivalent attitudes of our fellow citizens about our schizophrenic national tobacco policies. But when it comes to deciding what we as a Nation are to do about our most widespread addiction—and the most costly in terms of health damage and death—we are left almost where we started with our value conflicts—freedom of individual choice versus society's overall interests, the health costs of tobacco smoking versus the economic benefit of the industry and the taxes it produces.

Similarly, when one thinks about what should be done about illicit drug use, one always comes back to cultural institutions—the family, the school, and the church. And here too the potency of science palls in comparison to the shared values of those in our social systems. It is essential to expand our scientific knowledge about drug use and its consequences, but we must not overvalue this knowledge. We must not wait until "all the evidence is in" (it never is in science!) before making decisions and shaping policies. We have, in a word, overreacted during the last decade to our earlier overreaction in the other direction.

I certainly do not intend to demean the values of science for drug abuse prevention. Science has and can continue to provide more correct and rational bases for drug abuse policy, including more effective prevention, treatment, and law enforcement policies. It can also help develop new understanding of the nature of drug abuse itself and dramatic new techniques for prevention and treatment. In fact, we now need substantially more invested in science with greatly increased emphasis on bridging the gap between science and the practitioner and on targeting research more precisely on the most important questions.

My concern, however, is that we, in our shared confusion over drug abuse, not abdicate to science the responsibility which rests with each of us individually and collectively.

We will, in the next decade, have to search out a more balanced attitude which uses the great help science offers while retaining responsibility in ourselves and our institutions for resolving the enormous and recalcitrant value conflicts with which drug abuse prevention abounds.

Finally, the drug abuse prevention field has spent the last decade struggling for a stable, respectable identity. That struggle has been successfully completed. Now it is time to consider the opportunities for leadership in the wider health and social policy areas. The new global interest in prevention in health has forced us to recognize that the major gains to be made in the next few decades in improving the health and the quality of life in the United States and in other nations will come down to choices made by individuals—choices which, in their totality, we are increasingly calling "lifestyles." Improvements in health in the remaining decades of this century will have more to do with diets and exercise and drug use than with hospitals, doctors, and vaccines. The drug abuse prevention field has much to learn itself about this process of making lifestyle choices and the potentials for influencing these choices ranging from legal sanctions, to economic incentives, to health information, to direct intervention. As we solve our drug abuse problems, we will also contribute to the vital knowledge base which forms the foundation for the new field of behavioral health. The complex interactions of biology with economic and cultural factors which are familiar to those working in drug abuse prevention, are also at the root of other behavioral health issues. Cocaine and marihuana do make many people feel good—for a while. So do inactivity and sugar. Some of this good feeling from unhealthy behavior is biological. Genetics may play a role in determining which people are more likely to have which behavioral disorders. We also know, however, that social, economic, and cultural factors play major roles in lifestyle choices. Unraveling these interactions and developing techniques to promote healthy lifestyles are the major business of the future for the drug abuse field and for the health and social service fields as well.